Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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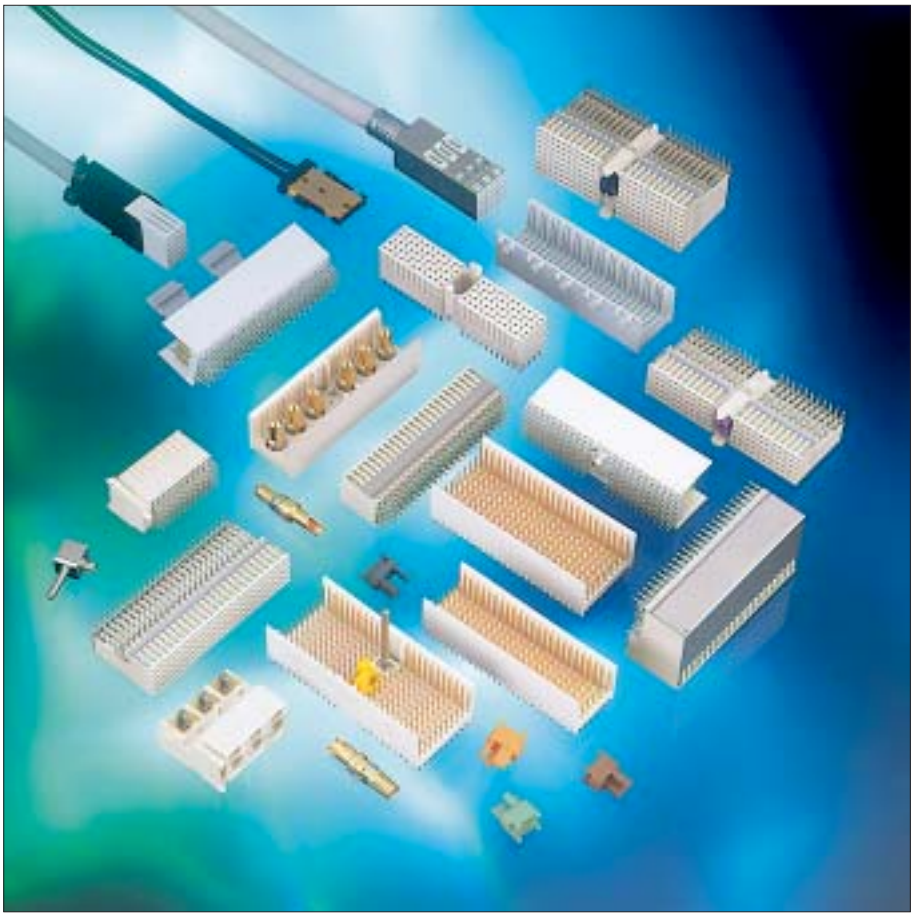
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

MILLIPACS® HM

2.0 mm Hard Metric Interconnection System



FCI

Millipacs® HM

Created in 1989, FCI - an Areva Group company - rapidly secured its place among the world's top three manufacturers of connectors and interconnect systems. With a turnover of 1.8 billion dollars in 2001, FCI currently operates in 29 countries where it covers the following markets: communications, data, consumer, industrial, military, aerospace, automotive and electrical power interconnect. The company employs 16,000 staff worldwide.

For more information, visit the website at www.fciconnect.com

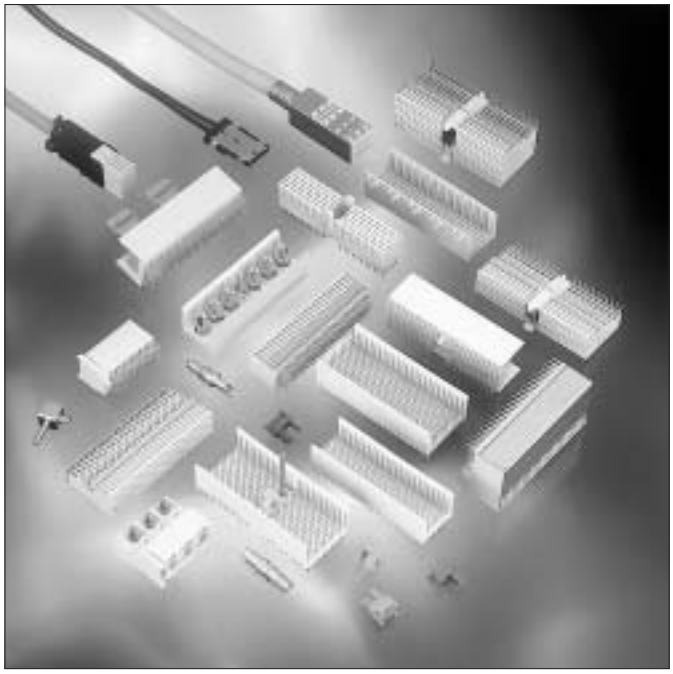
Content

Millipacs® HM

Features & benefits

Qualifications

- Designed in accordance with IEC 917 and IEC 61076-4-101.
- Fits DIN 43356 and IEEE 1301 Hard Metric Practice.
- Qualified by Bellcore as defined by GR-1217-CORE, iss. 1, November 1995.
- UL and CSA recognized.



Main features

Millipacs® is a standard 2.0 mm Interconnection System featuring 5 and 8 contacts rows and 2 rows for shielding and grounding.
Millipacs® is a modular system built up by a number of specific types of modules with different functions and features signal modules with up to 200 signal contacts per 50 mm module (in 8 row versions) as well as hybrid modules for power, coax and/or FO contacts.
It provides 3 mating levels with 1.5 mm in between and a 2,5 mm wiping length for the shortest contact.

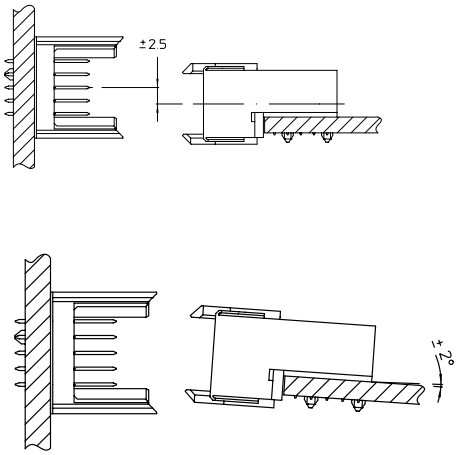
Both headers and receptacles are equipped with the well known FCI “eye of the needle” press-fit section for stable and reliable connections in the boards.
Misalignment of up to 2.5 mm and inclinations of 2° in both directions can be overcome.

FCI’s unique 1 piece female concept offers the most solid and reliable Hard Metric connector to the market. FCI is also offering the most versatile shielding solutions on their female concept: no shielding, top shielding, top and semi-rear shielding* or fully shielded modules are all standard available. Male modules are aligned next to each other without loss of contact positions and integrated edge polarization does guarantee a correct positioning of the different modules on the board. Module types without guiding features (type B and E) are to be used in between modules with the integrated guiding areas only.

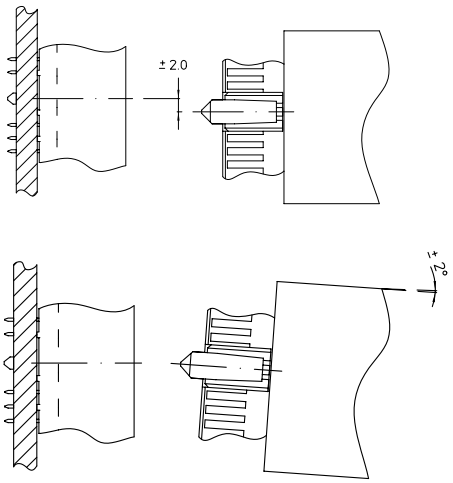
Small pin sizes and related small PT hole diameters both at backplane and component board level guarantee that conventional PCB routing, manufacturing and component assembly can still be used. Maximum wiring density (up to 3 tracks in between 2 holes) can be achieved while no additional layers are required.

* on request

Allowed inclination

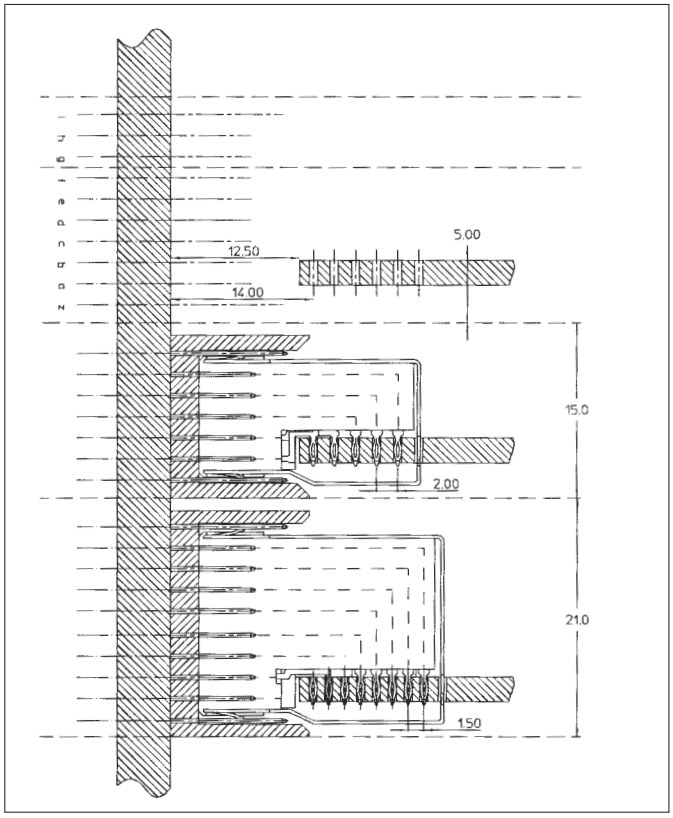


Allowed misalignment

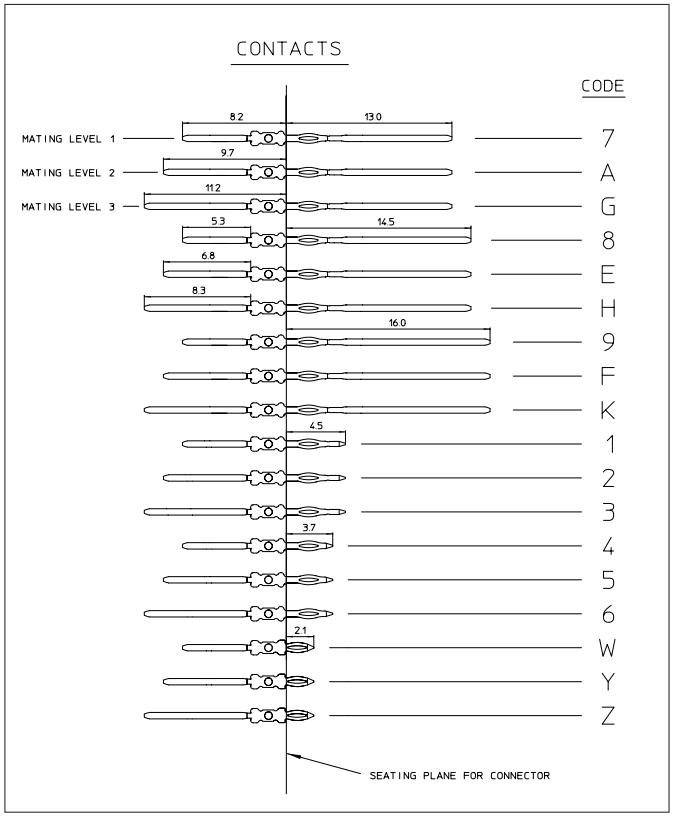


Millipacs® HM

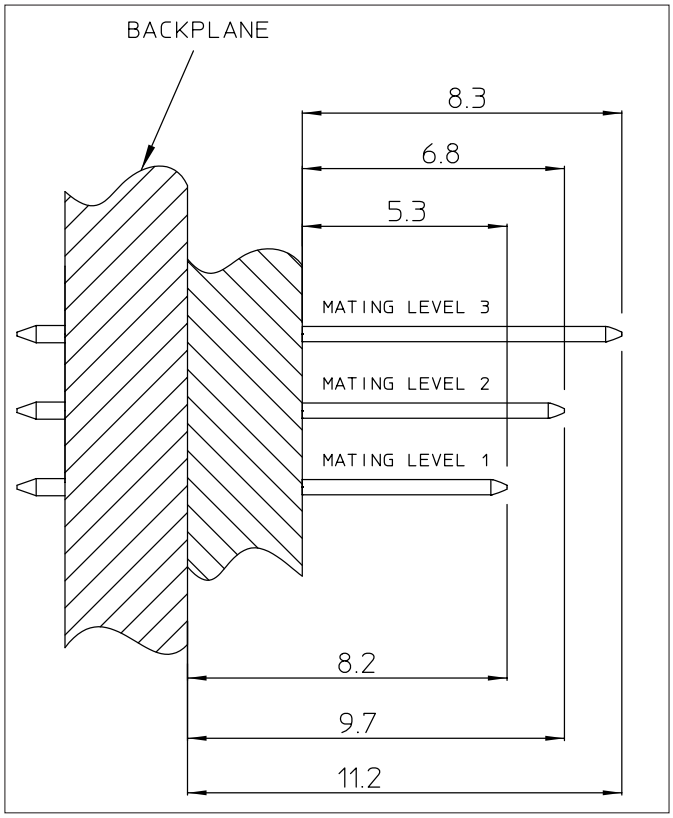
Built-in dimensions



Contacts overview



Signal contacts mating levels



Millipacs® HM

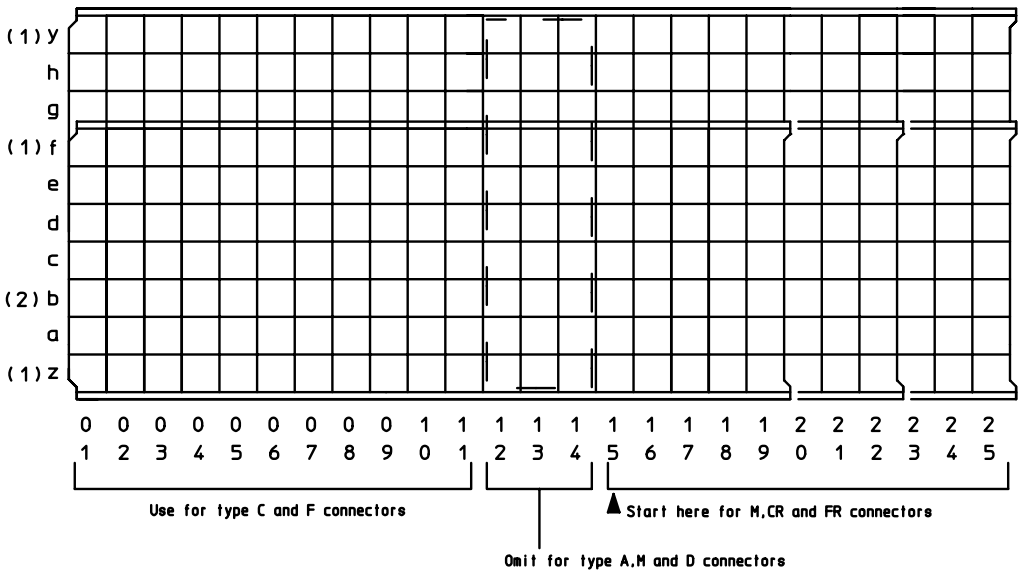
Customer Request Form for special loading

Description

This chart can be used to fill in a specific contact pin configuration for your application. An overview of the existing pins (with the corresponding code to be filled in) is listed on page 4. Please, leave unfilled positions blank.

Note : Check on the FCI website to download the customer request form.

Connector type (circle corresponding letter):
A,B,B22,B19,AB,AB22,AB19,C,CR,D,DE,E,F,FR,M



NOTES

(1) Ground return shield contacts only, mating level 3 required. z+F for 5+2 row connector, z+y for 8+2 row connector.

(2) No level 3 contacts allowed when mating with right angle female connector

Name : _____

Company : _____

Address : _____

_____

Phone : _____

Fax : _____

E-mail : _____

Performance level : ☐ 1 ☐ 2 ☐ 3

Remarks : _____

_____

_____

_____

_____

Millipacs® HM

Features and benefits

High speed signal transmission

With modern electronic devices, higher bitrates require improved electrical performance of all components in terms of signal transmission. As a consequence, all picosecond-system designers should anticipate the need to control the impedance and cross talk.

In order to accommodate you with a high speed interconnection system, the high frequency characteristics such as reflection, rise time degradation and cross talk (forward and backward) are measured and simulated for different signal-to-ground configurations of the Millipacs® system.
A high accuracy is needed to characterize the connectors over a wide bandwidth or over a large range of rise times. The measurement set-up is shown in figure 1.

FCI's R&D specialists are available to help to define the best installed cost solution in terms of your specific High Speed requirements. A complete set of reports is available on request.

As an example, the results for a differential pin configuration on a 5 rows 2 mm grid Millipacs® backplane connector (figure 2) are presented.

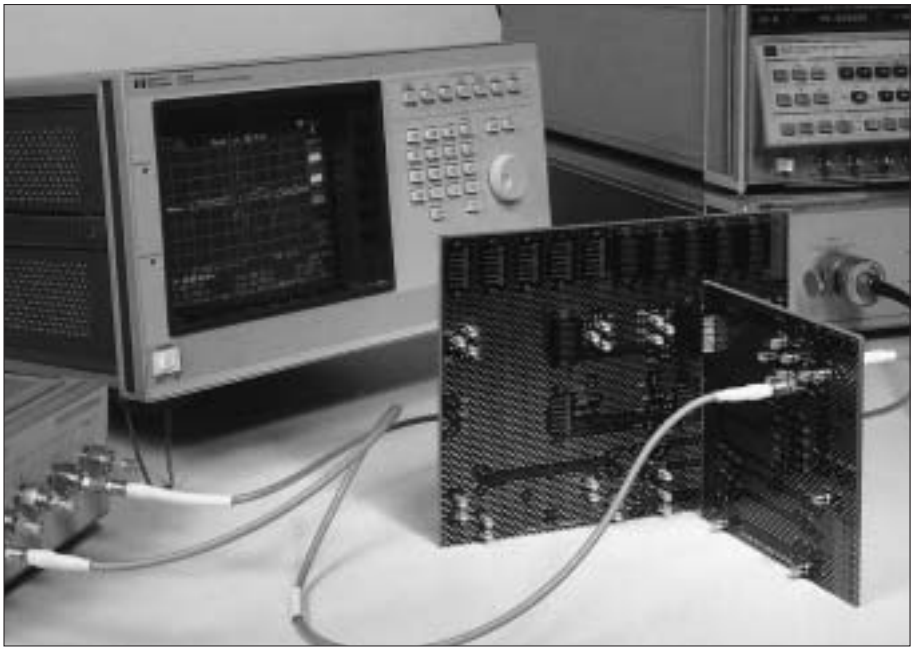


Fig.1 : Test set-up for high-frequency characterization of the Millipacs® backplane connectors

row E	**S+**	**S+**	**S+**	**S+**	**S+**
row D	**S-**	**S-**	**S-**	**S-**	**S-**
row C	**G**	**G**	**G**	**G**	**G**
row B	**S+**	**S+**	**S+**	**S+**	**S+**
row A	**S-**	**S-**	**S-**	**S-**	**S-**

Fig.2 : Differential pin configuration (G=ground; S=signal)

Figures 3 and 4 respectively show for pin pairs on rows A-B and D-E, the reflection and rise time degradation of the odd mode as a function of rise time. At larger rise times the reflection curves converge to 0%, because the transmission line behavior of the pins disappears at lower frequencies. At the lower rise times, the reflection coefficient still stays below 20%.

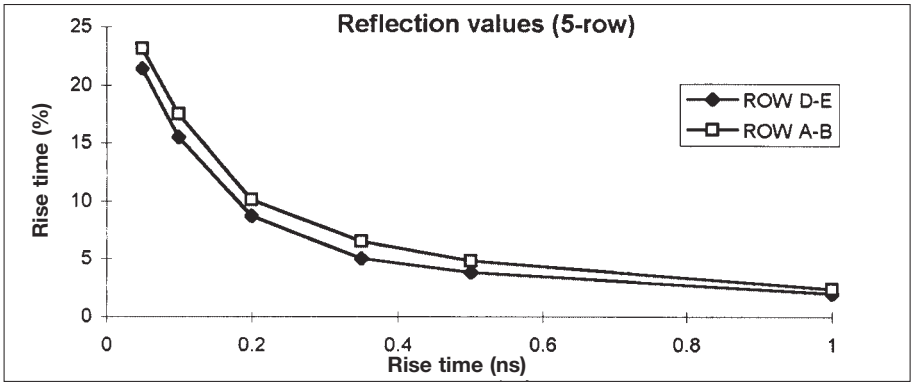


Fig.3 : Reflection values for the odd mode of pin pairs A-B and D-E as function of rise time

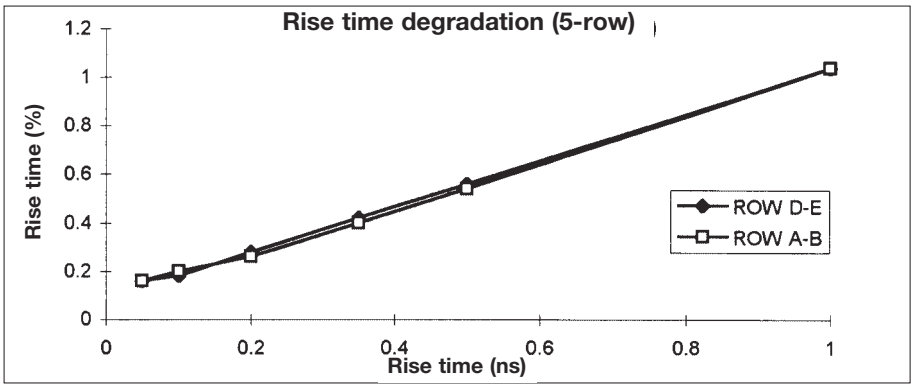


Fig.4 : Rise time degradation for the odd mode of pin pairs A-B and D-E as function of rise time

Figures 5 and 6 show the multi-line forward, respectively backward cross talk on the same pin pairs A-B and D-E i.e. the differential signal at the far- and the near-end of these pairs, when the neighboring pin pairs are excited in phase with differential signals. These worst case results show that for a rise time of 350 ps, the forward crosstalk is less than 2% and the backward crosstalk is about 10%.

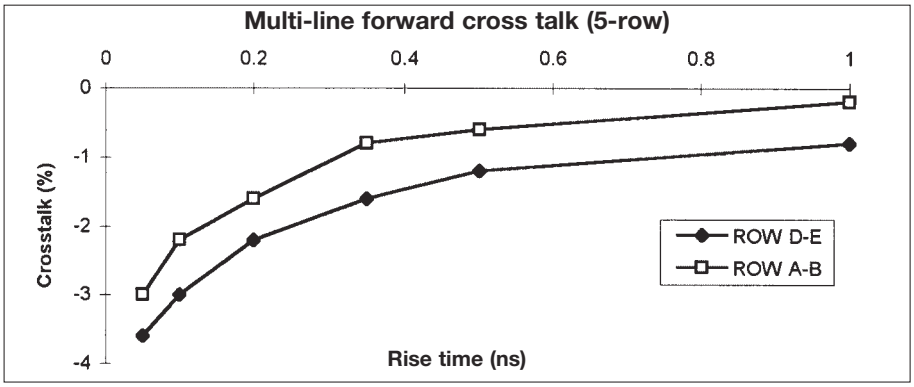


Fig.5 : Multi-line forward cross talk on pairs A-B and D-E as function of rise time

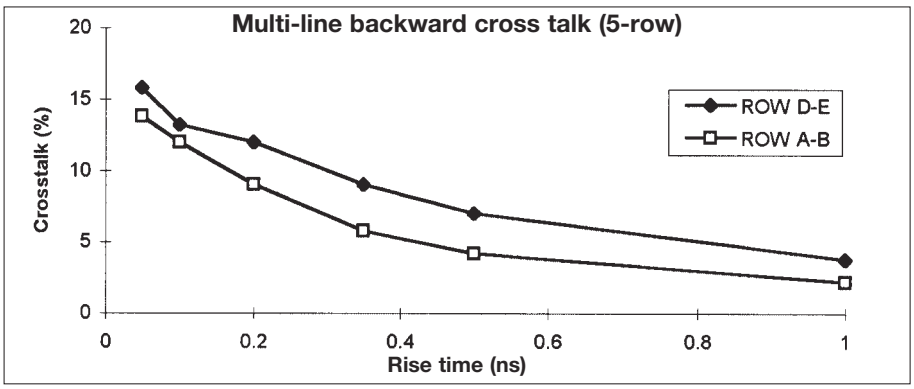


Fig.6 : Multi-line backward cross talk on pairs A-B and D-E as function of rise time

Features and benefits

Shielding performance

With the increasing coverage of the electromagnetic spectra and the constantly increasing use of electronic hardware, the need for control on electromagnetic interference is one of the main issues in modern system design. As a result, the Millipacs® connector system is anticipated with a complete range of shielding possibilities.
In order to evaluate the shielding performance of the Millipacs® connector a measurement set-up was designed based on a triaxial set-up (figure 7), formed by an innerline (the connector with his shield) and an outerline (the shielding with an external conductor). One of these transmission line structures is used to forge a current on the shield, the opposite is a sense line to detect the induced fields.

Shielding effectiveness is a functional method to characterize the shield leakage, since it offers us the relation between the measured power progressing from shielding leakage and the reference power delivered to the test-cel.

Figure 8 displays the shielding effectiveness of the non-shielded Millipacs® backpanel connector. As can be noticed, the shielding effectiveness is improved approx. 35 dB at higher frequencies (3 GHz) when shielding is introduced.

Fig.7 : Triaxial test cel

$$S.E.(dB)=10 \log \left(\frac{P_{leakage}}{P_{ref}} \right)$$

Formula 1 : Shielding effectiveness

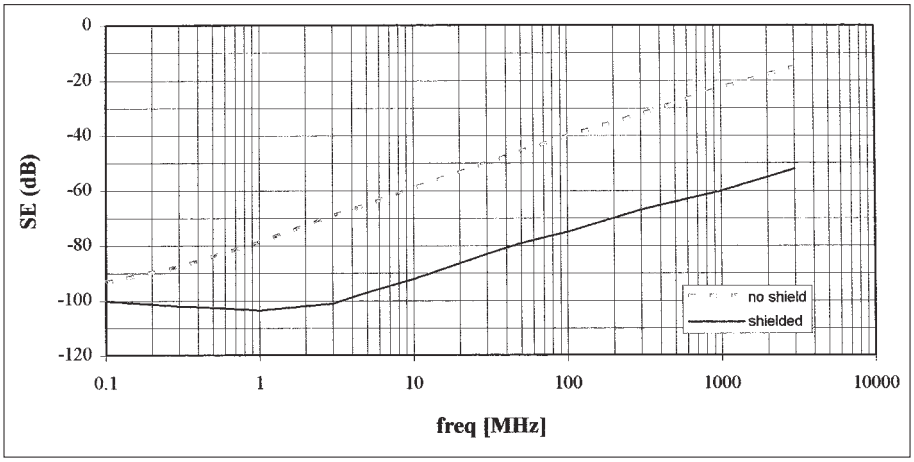


Fig.8 : Shielding effectiveness of the shielded and non-shielded version

Millipacs® HM

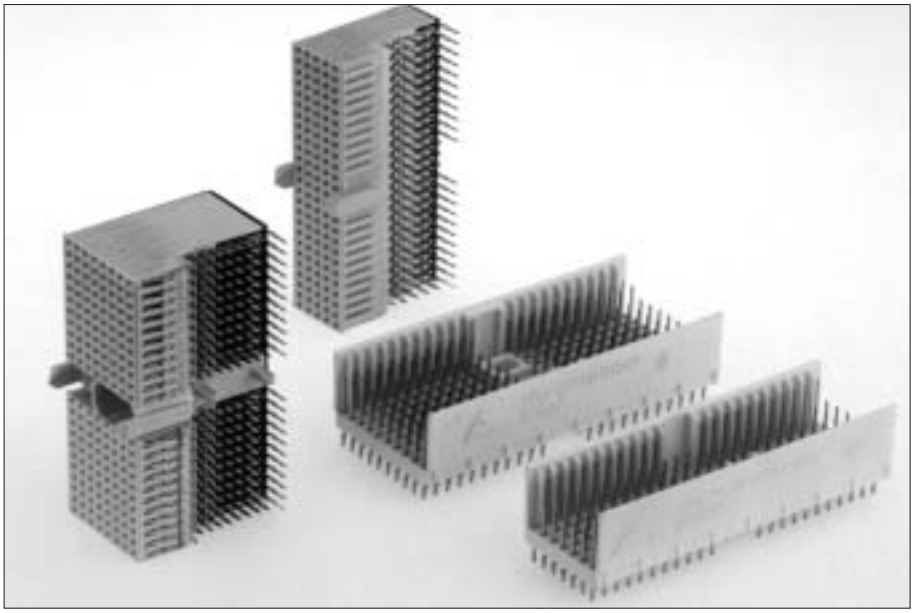
Male and female modules

Description

Connector modules with 5 (+2) or 8 (+2) row contact arrangement on a pitch of 2.0 mm featuring high density, shielding and high speed in a Hard Metric configuration.

Performance characteristics

Operating temperature :	-55°C to +125°C
Operating current*	:1.5 A at 20°C 1.0 A at 70°C
Test voltage*	:750 Vrms
Contact resistance	:20 mΩ max
Insulation resistance	:10^4 MΩ min
Mating force	:0.75 N max per contact pair
Withdrawal force	:0.15 N min per contact pair
Hertz stress	:200 Kpsi min
Misalignment	:Longitudinal ±2.0 mm Transversal ±2.5 mm
Inclination	:±2.0°



3 Contact levels	:5.30 mm 6.80 mm 8.30 mm
Normal force	:0.75 N min (EOL)
Creepage and clearance* :	0.6 mm min (free modules) 0.8 mm min (fixed modules)

* Fully loaded

Construction

Insulator material	:high temperature thermoplastic UL94V0
Contact material	:phosphor bronze
Contact plating	:selective Au over Ni on mating areas SnPb over Ni on press-fit and IDC areas

Performance levels :*
Front mating contacts (termination C,D)

Performance level	Mating cycles	Plating code
3	50	Z1
2	**250**	**N9**
1	500	E9

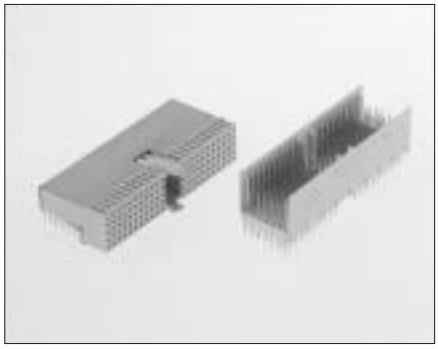
Front + rear mating contacts (termination K,M and N)

Performance level	Mating cycles	Plating code
3	50	GC
2	**250**	**GF**
1	500	GL

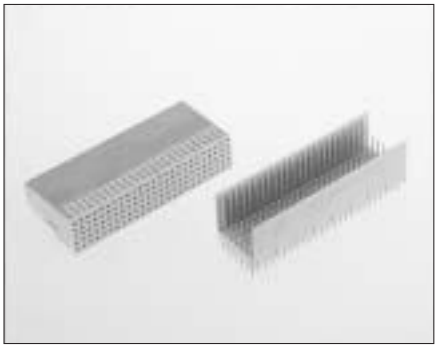
* Bellcore & Telcordia compliant plating and lubrication available. Please contact FCI for details.

Millipacs® HM

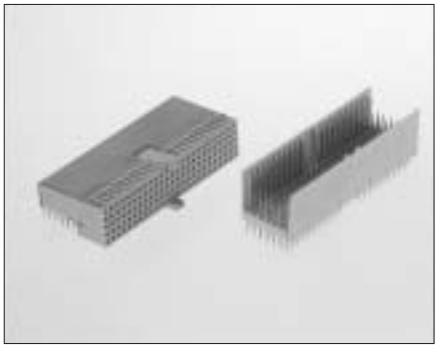
Product range overview



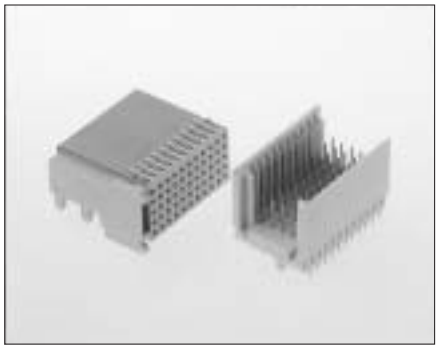
Type A connectors
- 50 mm module.
- 110 signal contacts.
- With “MP” multi-purpose center for polarization, pre-guiding and coding.
- Non-shielded and shielded versions.



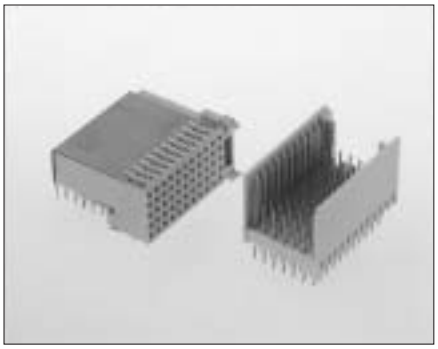
Type B connectors
- 38, 44 or 50 mm module.
- 95, 110 or 125 signal contacts.
- Non-shielded and shielded versions.



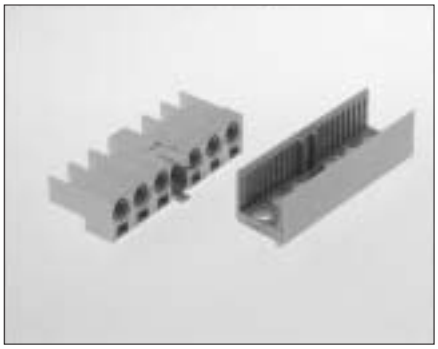
Type AB connectors
- 38, 44 or 50 mm module.
- 95, 110 or 125 signal contacts.
- With extra guiding pegs for polarization and pre-guiding.
- Non-shielded and shielded versions.



Type C connectors
- 25 mm module.
- 55 signal contacts.
- End position modules .
- With “MP” multi-purpose center for polarization and pre-guiding.
- Non-shielded and shielded versions.

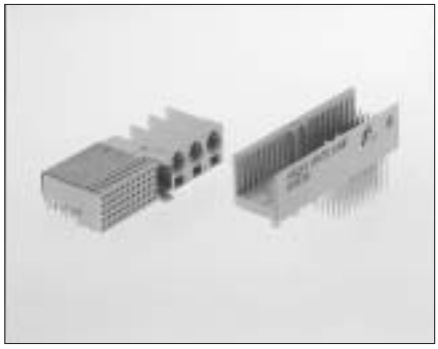


Type CR connectors
- 25 mm reversed C module.
- 55 signal contacts.
- Begin position modules.
- With “MP” multi-purpose center for polarization and pre-guiding.
- Non-shielded and shielded versions.

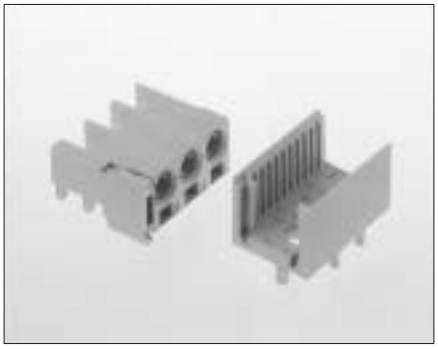


Type L connectors
- 50 mm module.
- 6 special contact cavities.
- With “MP” multi-purpose center for polarization, pre-guiding and coding.

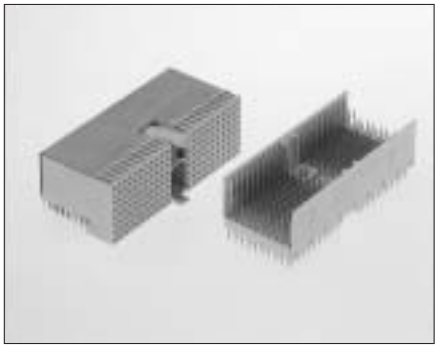
Millipacs® HM



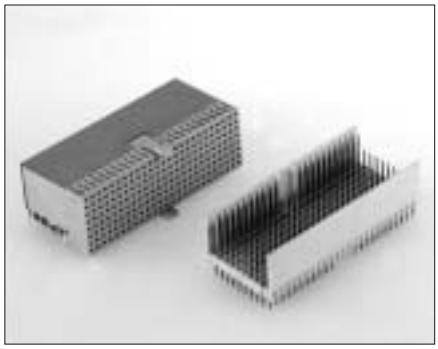
Type M connectors
- 50 mm module.
- 3 special contact cavities and 55 signal contacts.
- With “MP” multi-purpose center for polarization, pre-guiding and coding.
- Non-shielded and shielded versions.



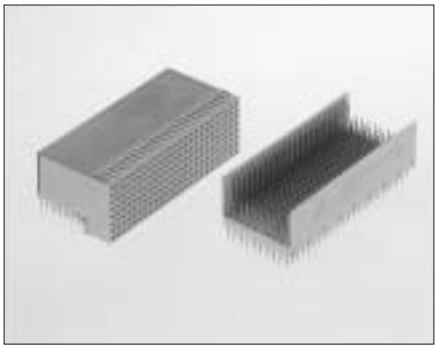
Type N connectors
- 25 mm module.
- 3 special contact cavities.
- End position modules only.
- With “MP” multi-purpose center for polarization and pre-guiding.



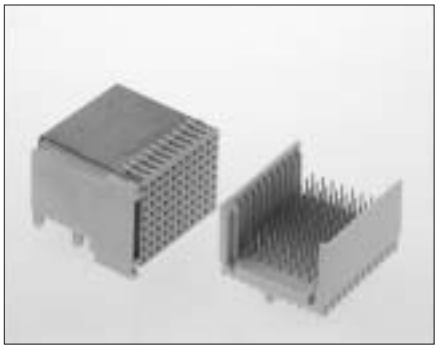
Type D connectors
- 50 mm module.
- 176 signal contacts.
- With “MP” multi-purpose center for polarization, pre-guiding and coding.
- Reduced PCB space.
- Additional guiding area.
- Non-shielded and shielded versions.



Type DE connectors
- 50 mm module.
- 200 signal contacts.
- Reduced PCB space.
- Non-shielded and shielded versions.
- With extra guiding pegs for polarization and pre-guiding.

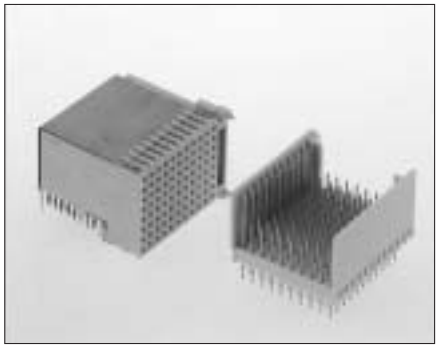


Type E connectors
- 50 mm module.
- 200 signal contacts.
- Reduced PCB space.
- Non-shielded and shielded versions.

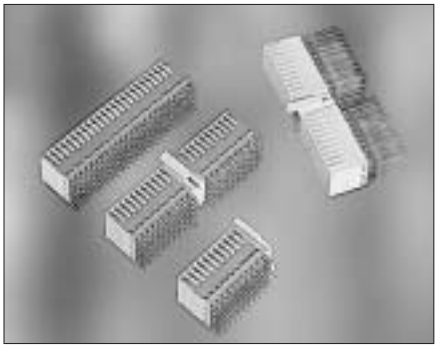


Type F connectors
- 25 mm module.
- 88 signal contacts.
- Reduced PCB space.
- End position modules .
- With “MP” multi-purpose center for polarization and pre-guiding.
- Non-shielded and shielded versions.

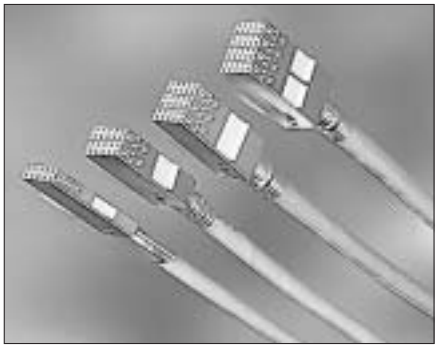
Millipacs® HM



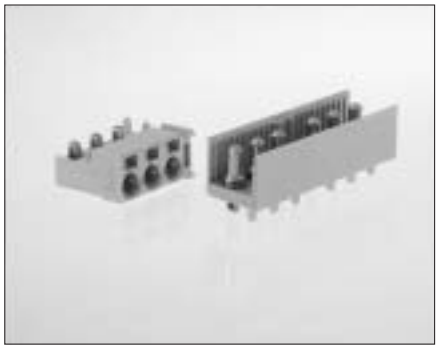
Type FR connectors
- 25 mm reversed F module.
- 88 signal contacts.
- Reduced PCB space.
- Begin position modules.
- With “MP” multi-purpose center for polarization and pre-guiding.
- Non-shielded and shielded versions.



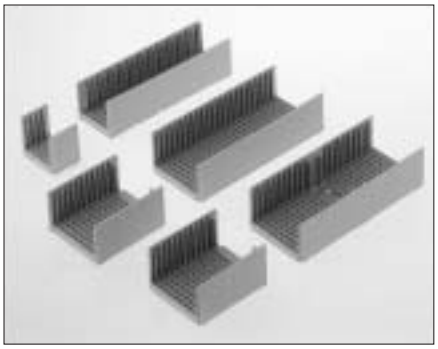
Straight female modules
- Type A, B and C female straight modules.
- To be mated with normal male header modules.
- Non-shielded and shielded versions.



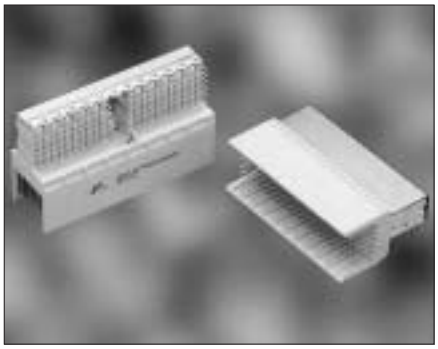
I/O cable connector modules
- To be mated with rear plug-up shrouds.
- Non-shielded and shielded versions.
- LF and HF versions.
- Moulded-in polarization features.



Pre-assembled power press-fit modules
- Type L, M and N modules.
- Non-shielded and shielded versions.
- Standard and advanced power contacts.



Board to Board shrouds, all types
- 10, 12, 25, 38, 44 and 50 mm modules.
- 5 and 8 row versions.
- Moulded-on spacers.

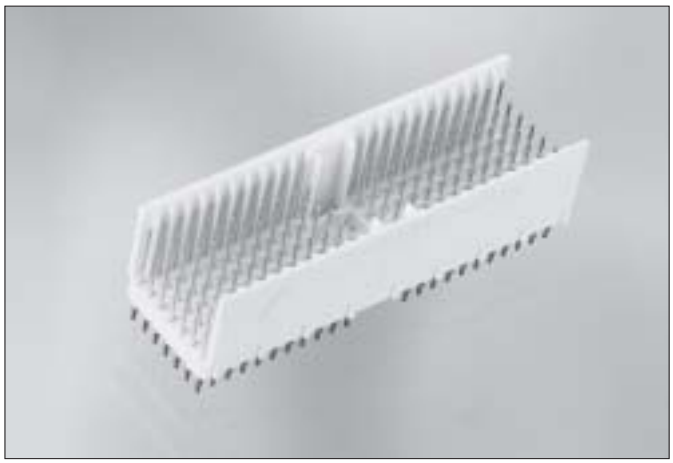


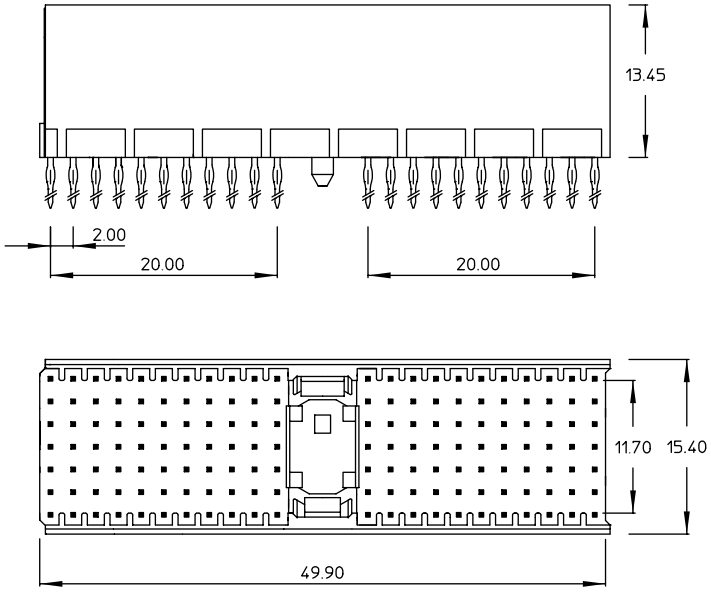
Male right angle modules
- Type A, B and C.
- Non-shielded and top shielded versions.

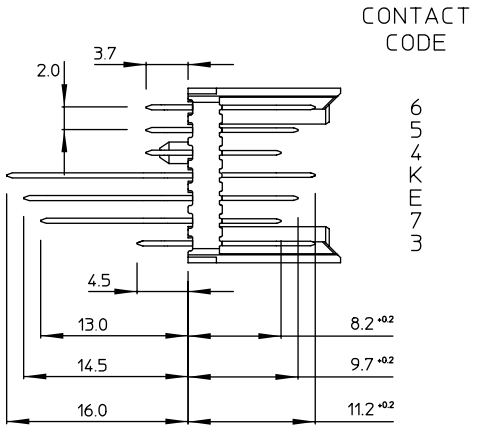
5+2 Row male signal straight press-fit-to-board connector : TYPE A

Description

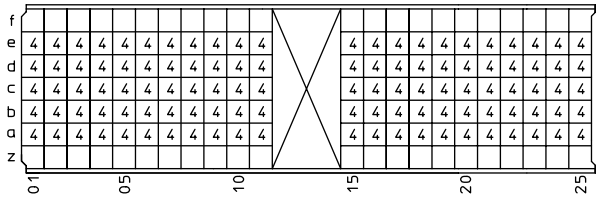
- 5 or 5+2 Row male header with 110 signal contacts.
- Integrated “MP” center for polarization and coding. (“MP” = multi purpose center)
- Press - fit terminations.
- 3 Mating levels.
- Non - shielded and shielded versions.
- Customized loading arrangements : see page 5.
- Board lay-out : see page 80.
- Module also used in CompactPCI; see CompactPCI catalog.



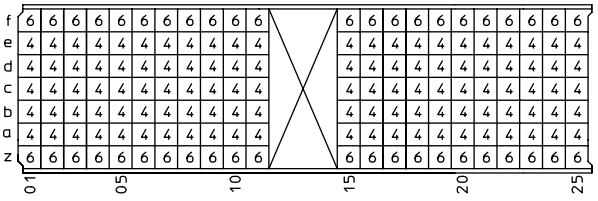




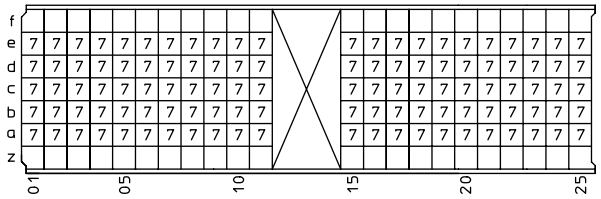
Standard loading patterns (seen from mating side)



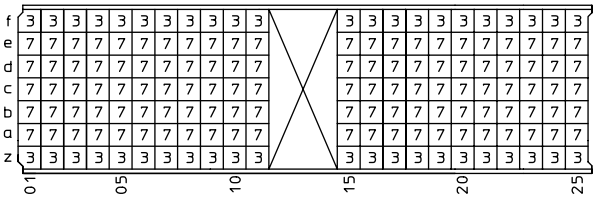
HM2P07PD5110N9



HM2P07PD5111N9



HM2P07PK5110GF

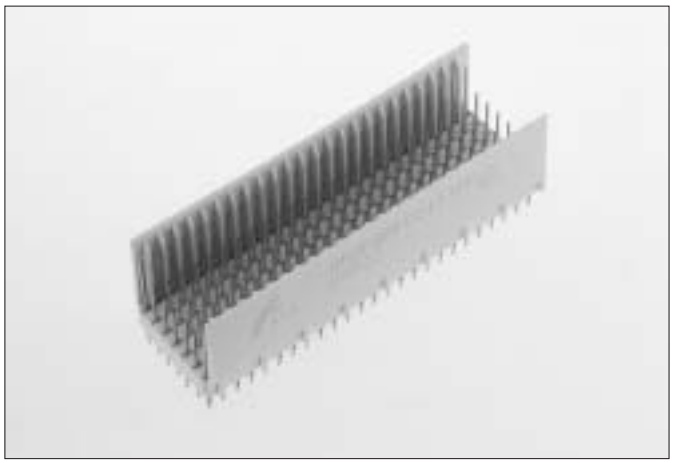


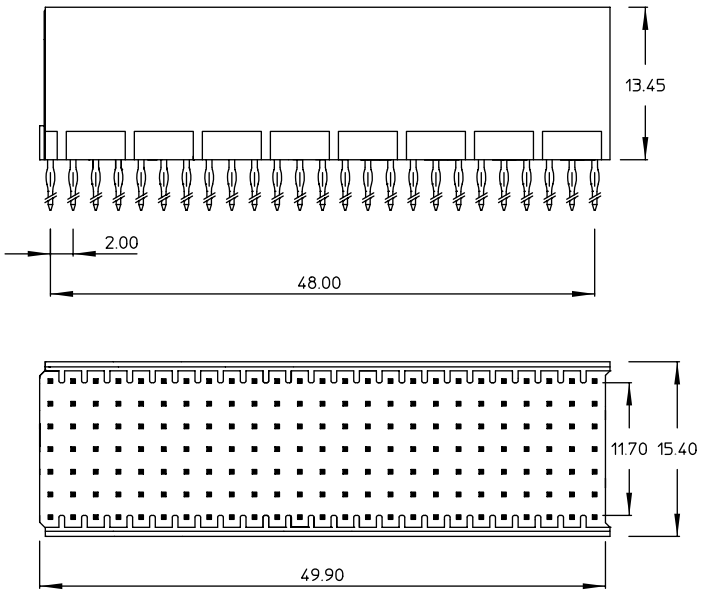
HM2P07PK5111GF

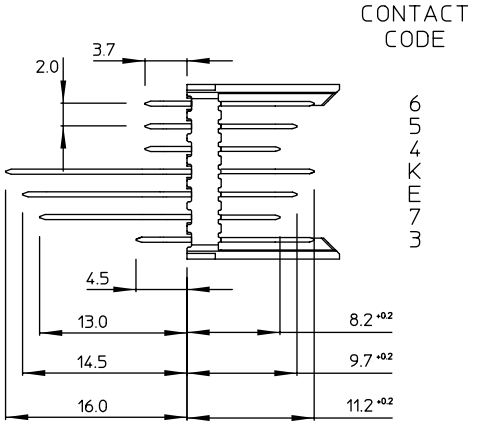
5+2 Row male signal straight press-fit-to-board connector : TYPE B

Description

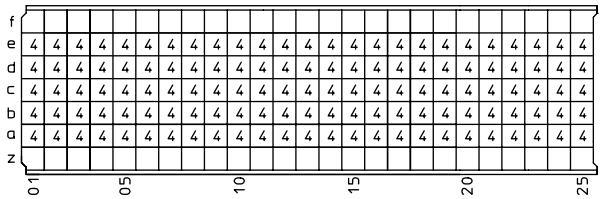
- 5 or 5+2 Row male header with 125 signal contacts.
- Press - fit terminations.
- 3 Mating levels.
- Non - shielded and shielded versions.
- Customized loading arrangements : see page 5.
- Board lay-out : see page 80.



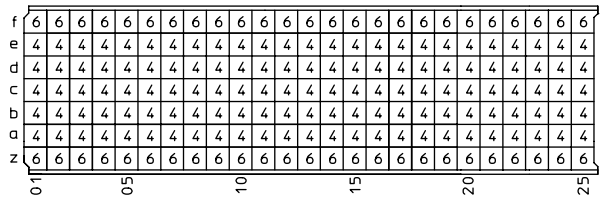




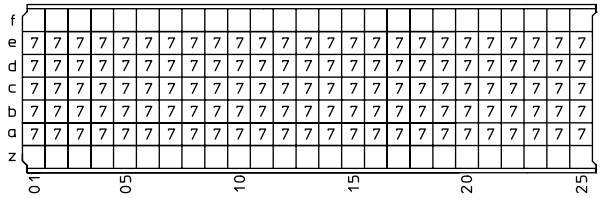
Standard loading patterns (seen from mating side)



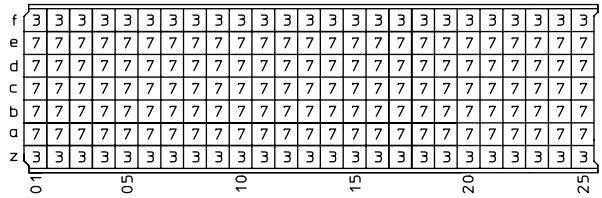
HM2P08PD5110N9



HM2P08PD5111N9



HM2P08PK5110GF

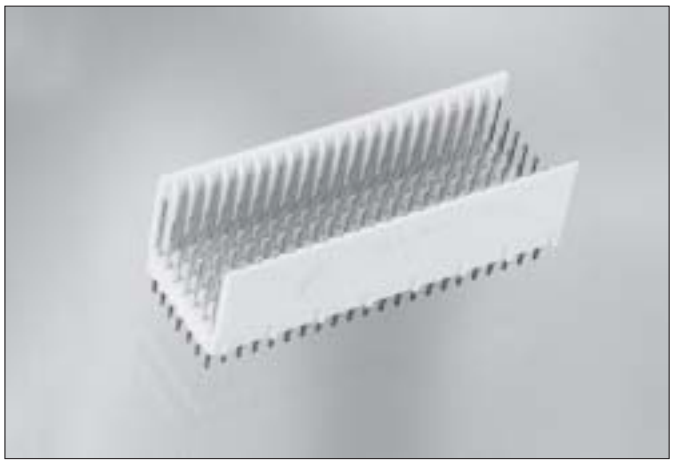


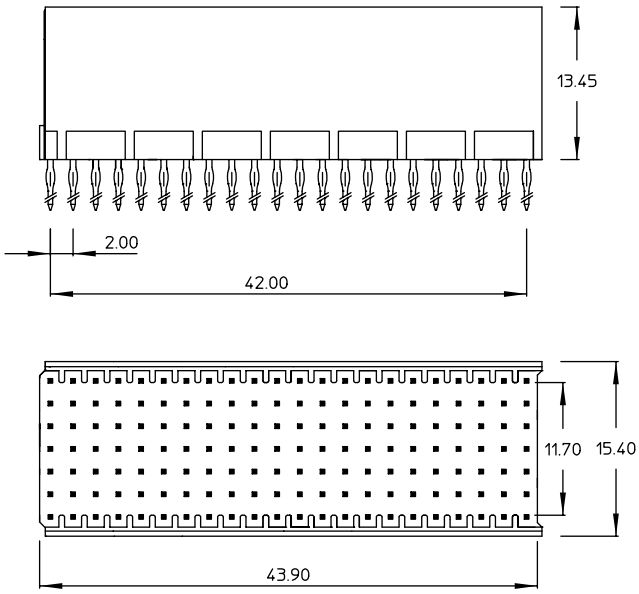
HM2P08PK5111GF

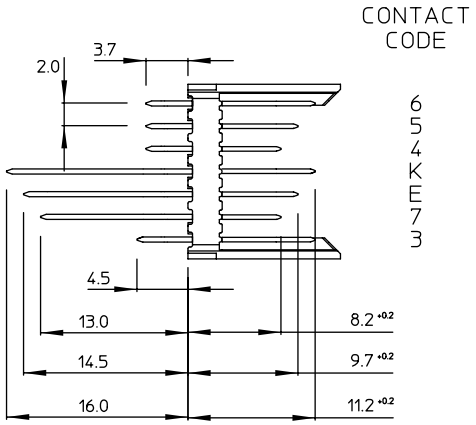
5+2 Row male signal straight press-fit-to-board connector : TYPE B22

Description

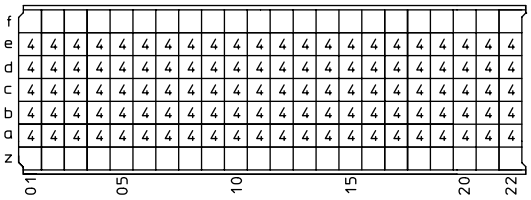
- 5 or 5+2 Row male header with 110 signal contacts.
- Press - fit terminations.
- 3 Mating levels.
- Non - shielded and shielded versions.
- Customized loading arrangements : see page 5.
- Board lay-out : see page 80.
- Module also used in CompactPCI; see CompactPCI catalog.



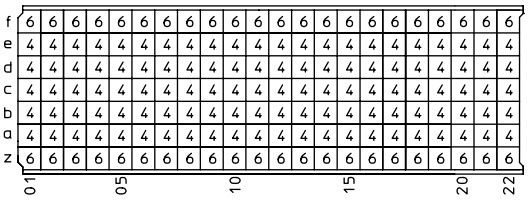




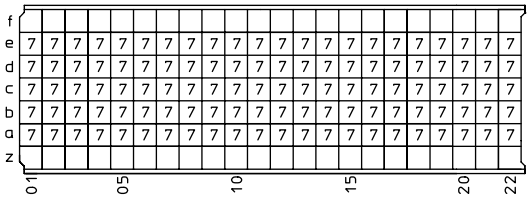
Standard loading patterns (seen from mating side)



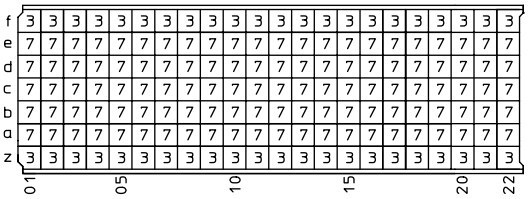
HM2P70PD5110N9



HM2P70PD5111N9



HM2P70PK5110GF

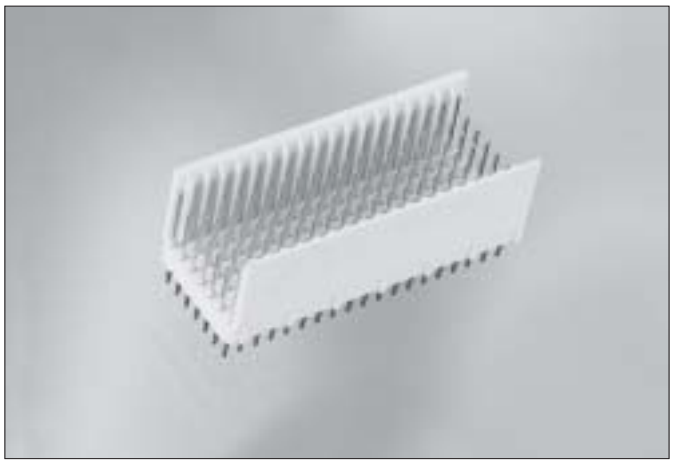


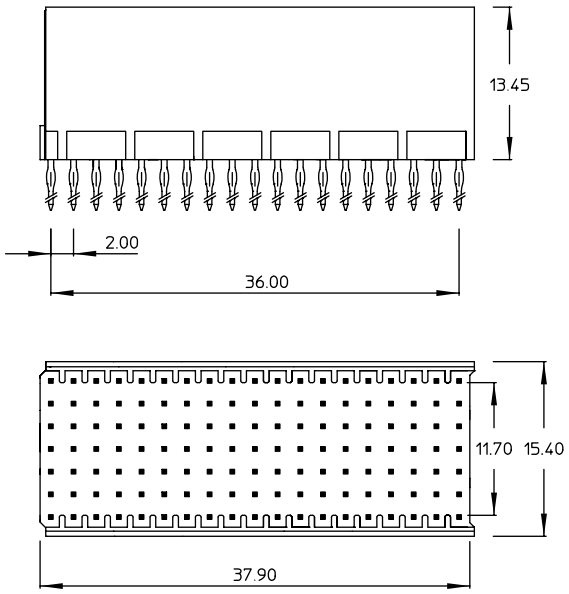
HM2P70PK5111GF

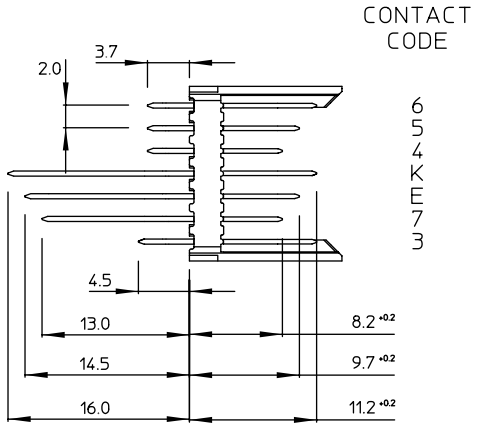
5+2 Row male signal straight press-fit-to-board connector : TYPE B19

Description

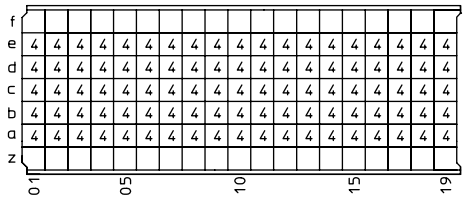
- 5 or 5+2 Row male header with 95 signal contacts.
- Press - fit terminations.
- 3 Mating levels.
- Non - shielded and shielded versions.
- Customized loading arrangements : see page 5.
- Board lay-out : see page 80.
- Module also used in CompactPCI; see CompactPCI catalog.



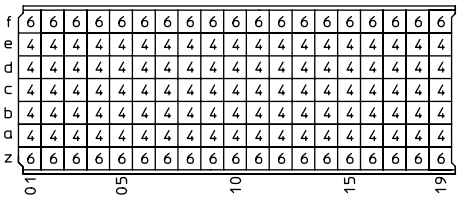




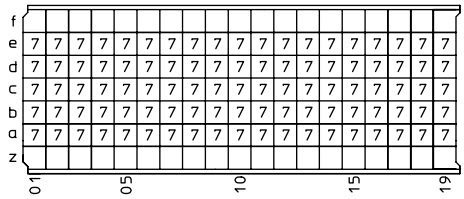
Standard loading patterns (seen from mating side)



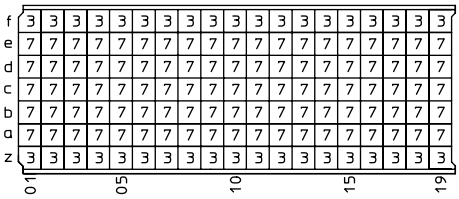
HM2P71PD5110N9



HM2P71PD5111N9



HM2P71PK5110GF

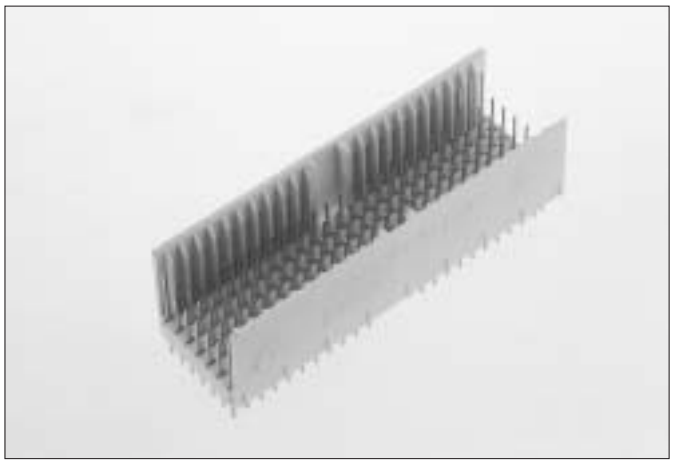


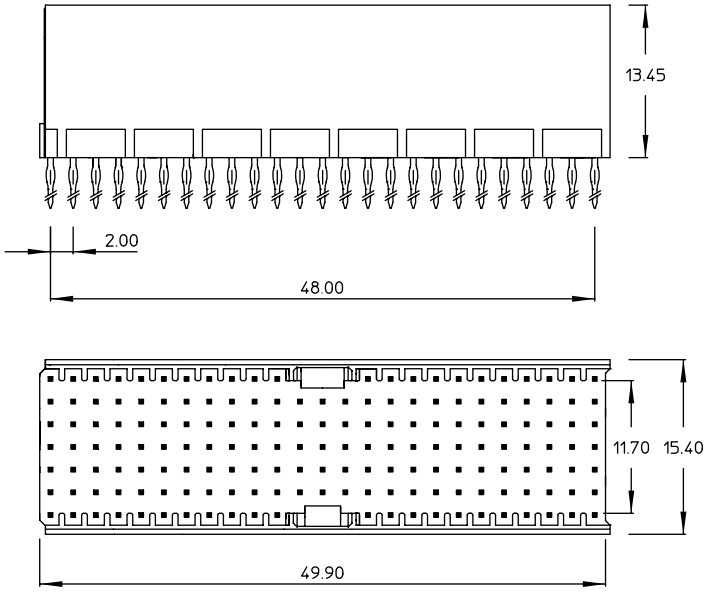
HM2P71PK5111GF

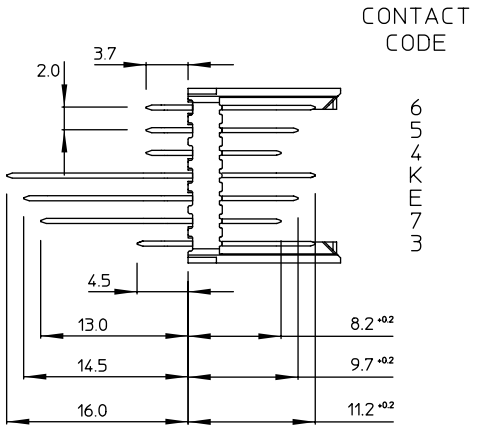
5+2 Row male signal straight press-fit-to-board connector : TYPE AB

Description

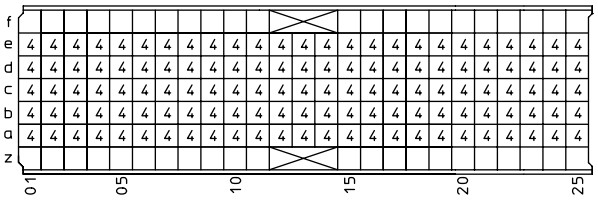
- 5 or 5+2 Row male header with 125 signal contacts.
- Integrated polarization and guiding area without loss of signal contact positions.
- Press - fit terminations.
- 3 Mating levels.
- Non - shielded and shielded versions.
- Customized loading arrangements : see page 5.
- Board lay-out : see page 80.



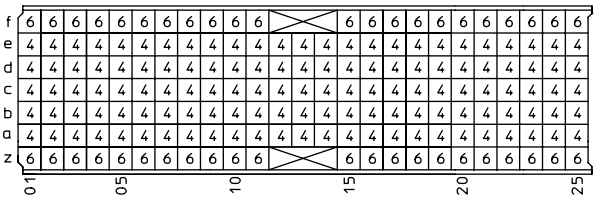




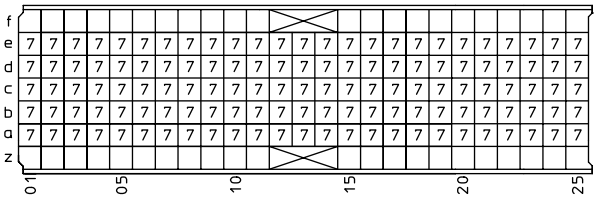
Standard loading patterns (seen from mating side)



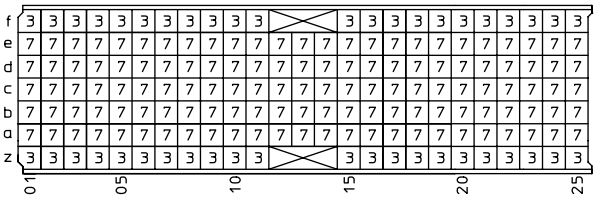
HM2P65PD5110N9



HM2P65PD5111N9



HM2P65PK5110GF

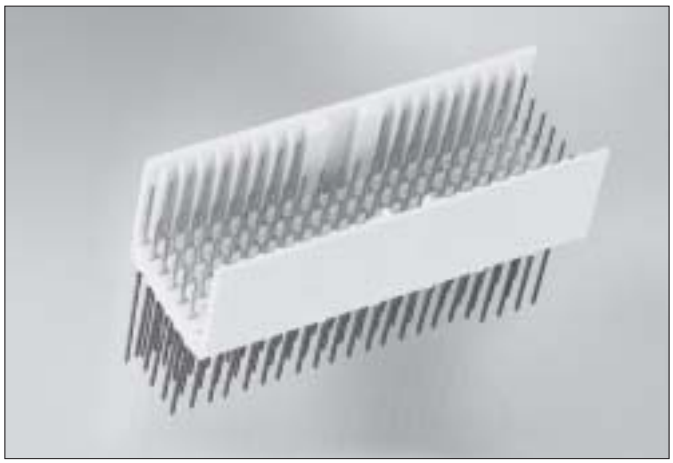


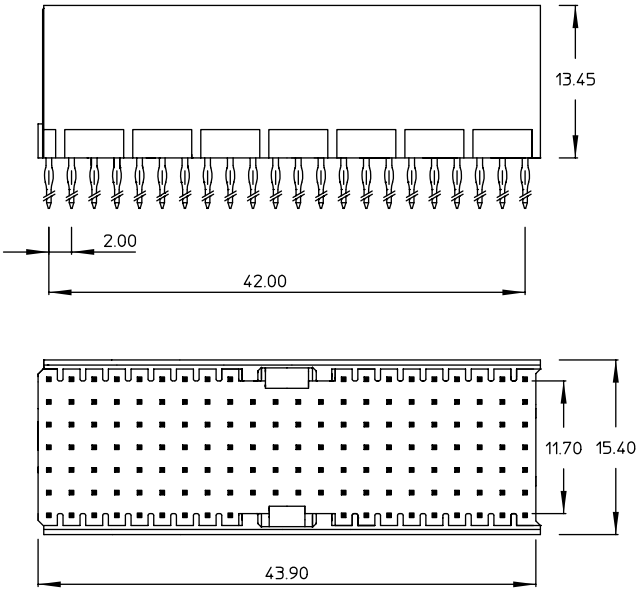
HM2P65PK5111GF

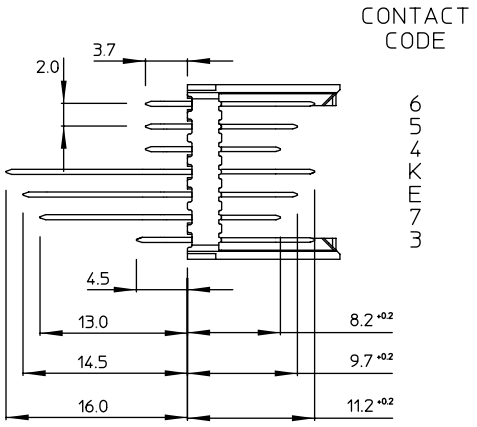
5+2 Row male signal straight press-fit-to-board connector : TYPE AB22

Description

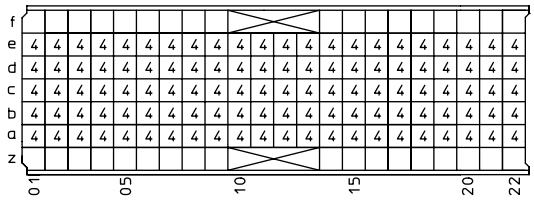
- 5 or 5+2 Row male header with 110 signal contacts.
- Integrated polarization and guiding area without loss of signal contact positions.
- Press - fit terminations.
- 3 Mating levels.
- Non - shielded and shielded versions.
- Customized loading arrangements : see page 5.
- Board lay-out : see page 80.
- Module also used in CompactPCI; see CompactPCI catalog.



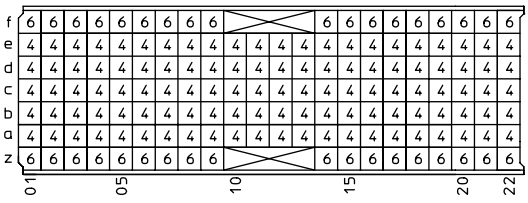




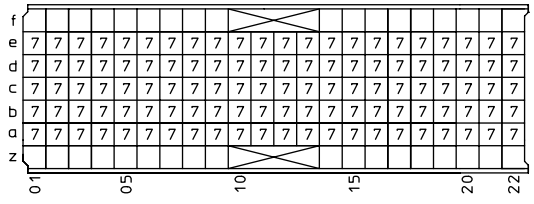
Standard loading patterns (seen from mating side)



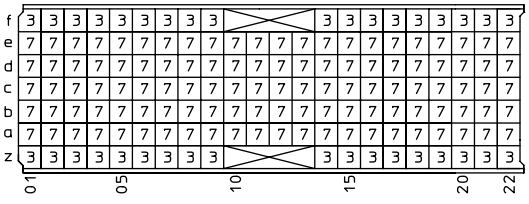
HM2P66PD5110N9



HM2P66PD5111N9



HM2P66PK5110GF

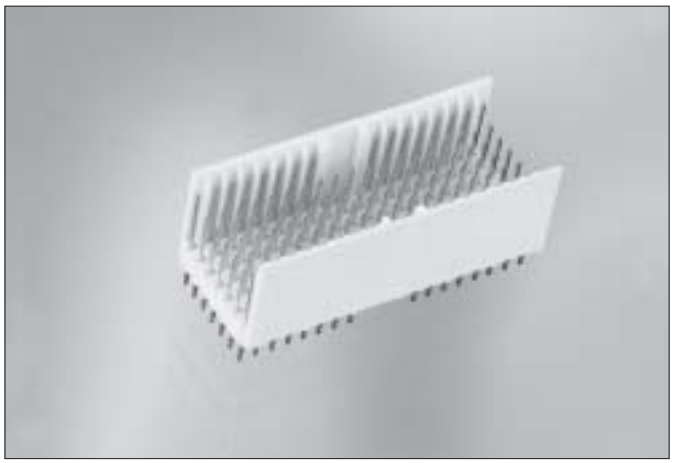


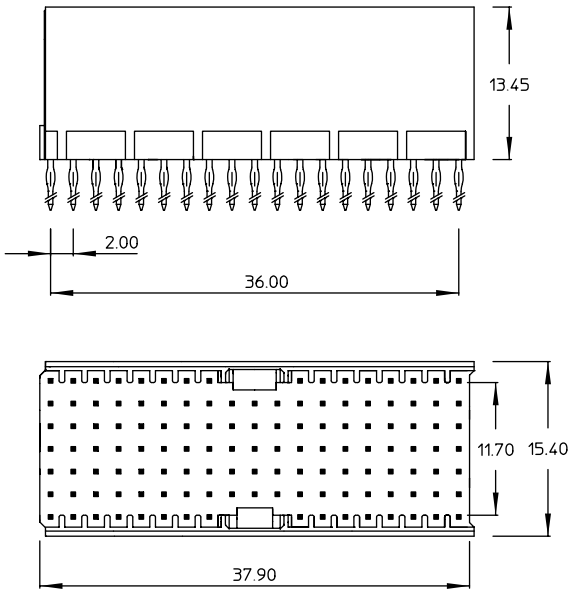
HM2P66PK5111GF

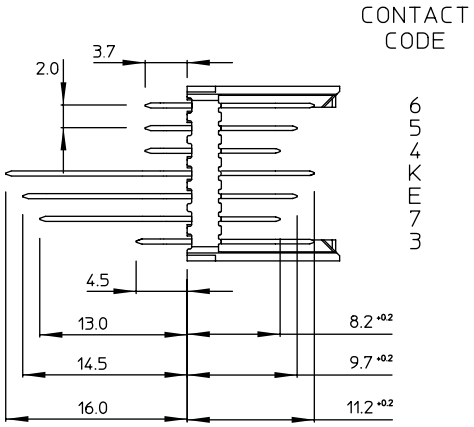
5+2 Row male signal straight press-fit-to-board connector : TYPE AB19

Description

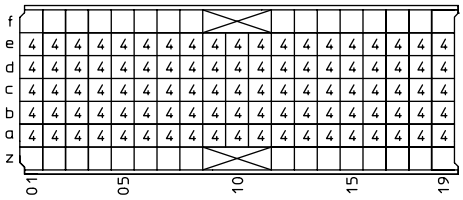
- 5 or 5+2 Row male header with 95 signal contacts.
- Integrated polarization and guiding area without loss of signal contact positions.
- Press - fit terminations.
- 3 Mating levels.
- Non - shielded and shielded versions.
- Customized loading arrangements : see page 5.
- Board lay-out : see page 80.
- Module also used in CompactPCI; see CompactPCI catalog.



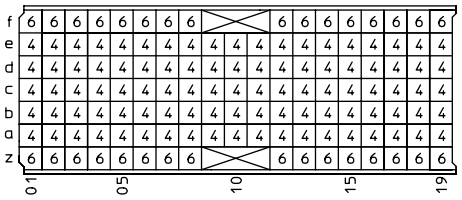




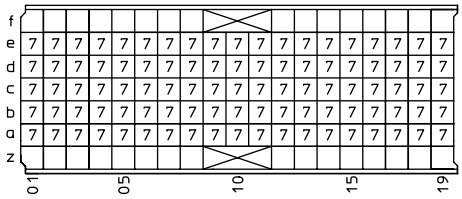
Standard loading patterns (seen from mating side)



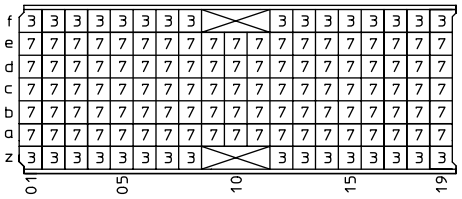
HM2P67PD5110N9



HM2P67PD5111N9



HM2P67PK5110GF

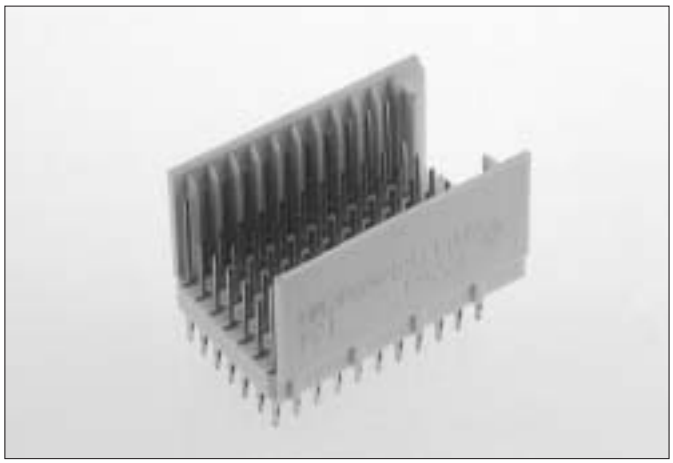


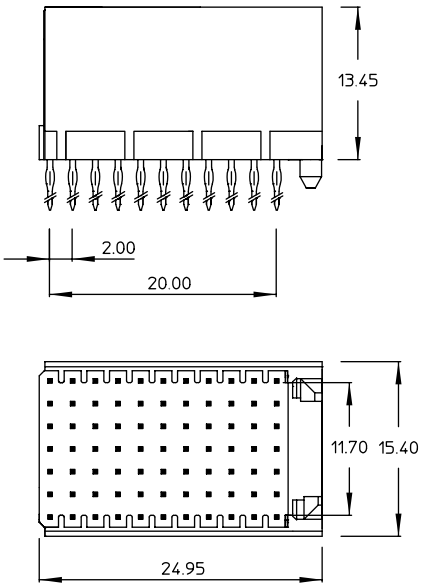
HM2P67PK5111GF

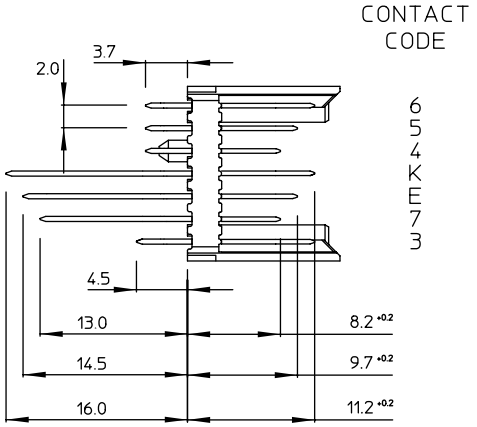
5+2 Row male signal straight press-fit-to-board connector : TYPE C

Description

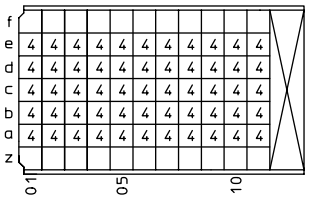
- 5 or 5+2 Row male header with 55 signal contacts.
- Integrated area for guiding & polarization.
- Press - fit terminations.
- 3 Mating levels.
- Non - shielded and shielded versions.
- Customized loading arrangements : see page 5.
- Board lay-out : see page 80.



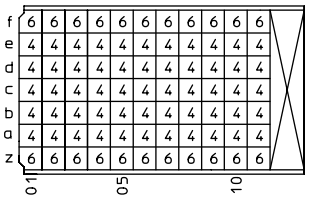




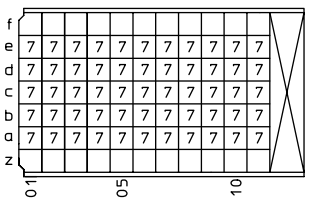
Standard loading patterns (seen from mating side)



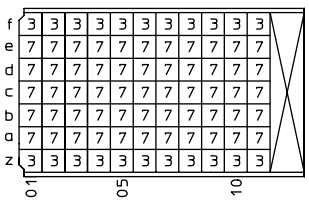
HM2P09PD5110N9



HM2P09PD5111N9



HM2P09PK5110GF



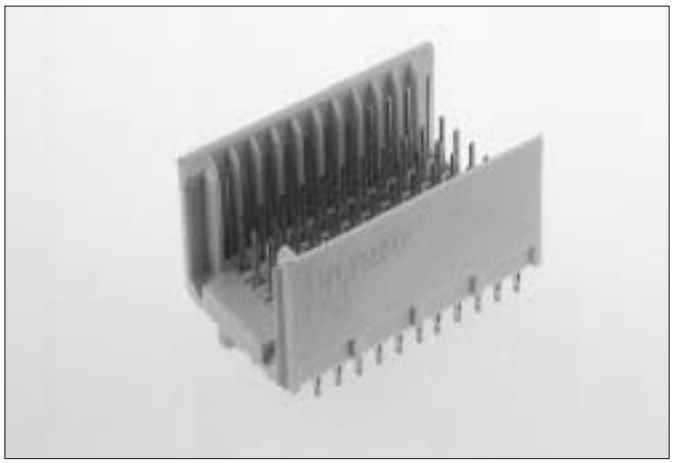
HM2P09PK5111GF

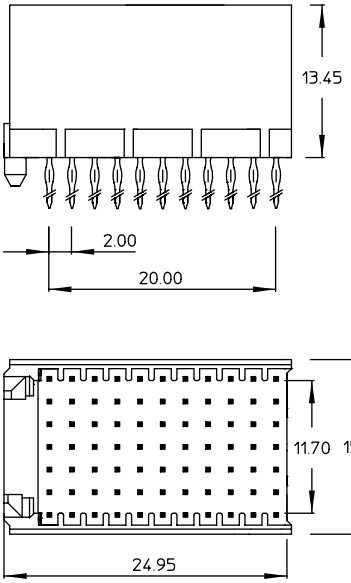
Millipacs® HM

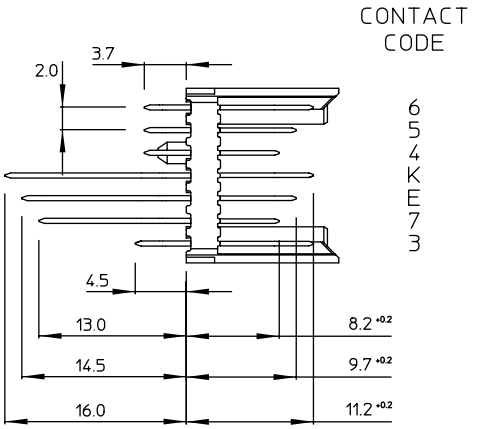
5+2 Row male signal straight press-fit-to-board connector : TYPE CR (C Reversed, FCI terminology)

Description

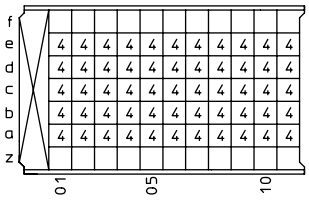
- 5 or 5+2 Row male header with 55 signal contacts.
- Integrated area for guiding & polarization.
- Press - fit terminations.
- 3 Mating levels.
- Non - shielded and shielded versions.
- Customized loading arrangements : see page 5.
- Board lay-out : see page 80.



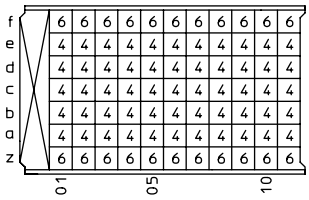




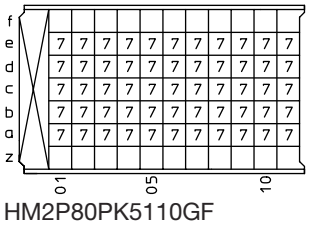
Standard loading patterns (seen from mating side)



HM2P80PD5110N9



HM2P80PD5111N9



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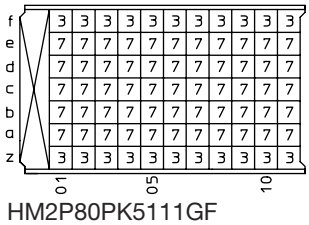
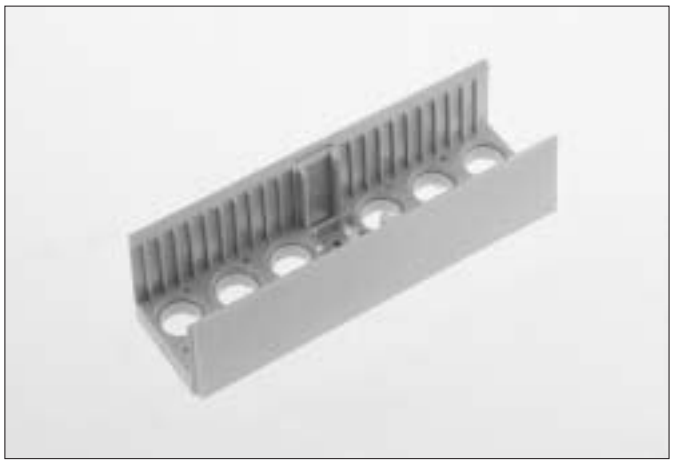


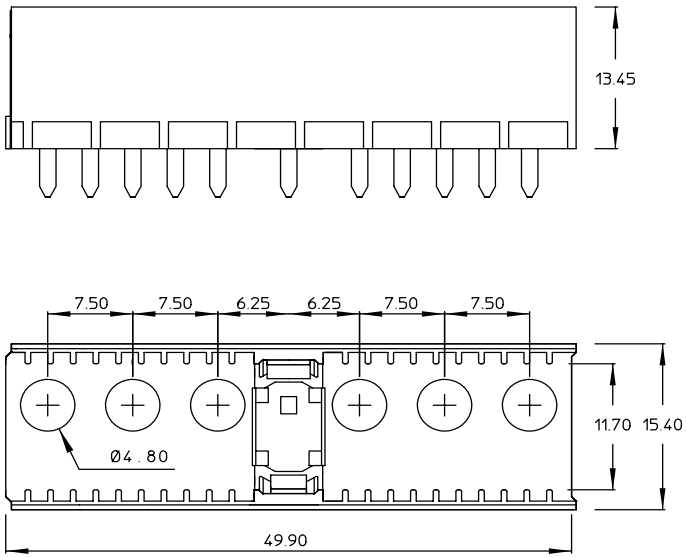
HM2P80PK5111GF

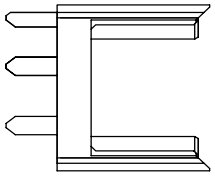
5 Row male hybrid housing for 6 DIN contacts : TYPE L

Description

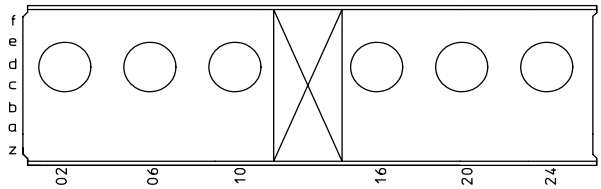
- 5 Row male housing with 6 special cavities.
- Integrated “MP” center for polarization and coding. (“MP” = multi purpose center)
- 6 x 4.8 mm diameter cavities for coax, power or FO contacts conforming DIN 41626.
- Pre-assembled modules with press-fit power contacts.
- Board lay-out : see page 80.





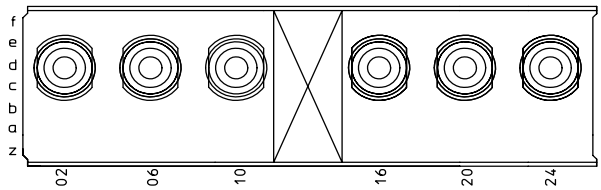


Empty housing :



HM2P10P1

Pre-assembled module with press-fit power contacts :



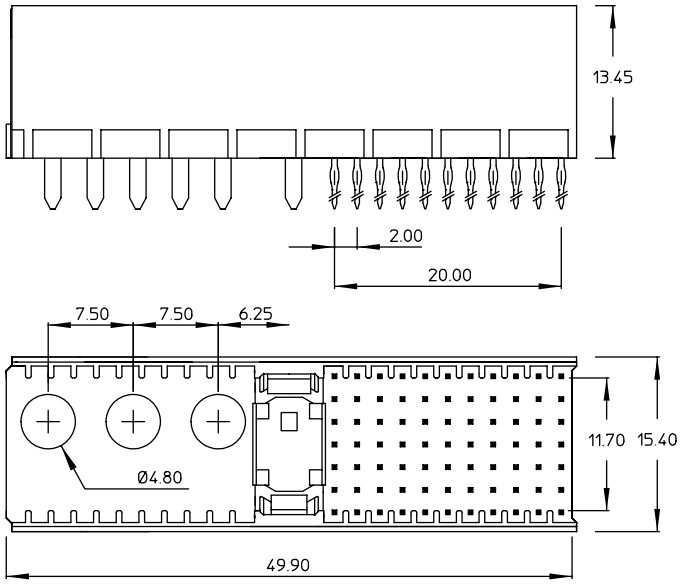
HM2A30PG5000

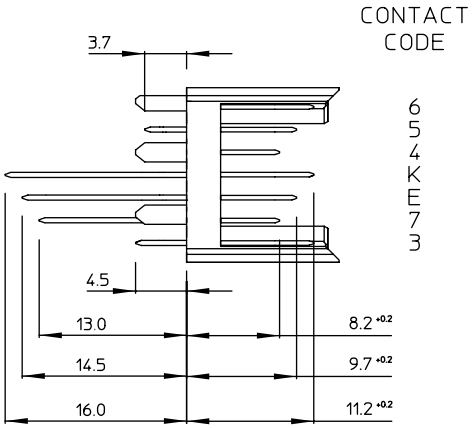
Millipacs® HM

5+2 Row mixed male signal straight press-fit-to-board connector : TYPE M

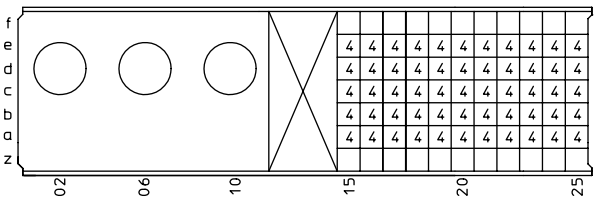
Description

- 5 or 5+2 Row male header with 55 signal contacts and 3 hybrid DIN cavities.
- Integrated “MP” center for polarization and coding. (“MP” = multi purpose center)
- Press - fit terminations for signal contacts.
- 3 Mating levels.
- Non - shielded and shielded versions.
- 3 x 4.8 mm diameter cavities for coax, power or FO contacts conforming DIN 41626.
- Pre-assembled modules with press-fit power contacts.
- Customized loading arrangements : see page 5.
- Board lay-out : see page 80.

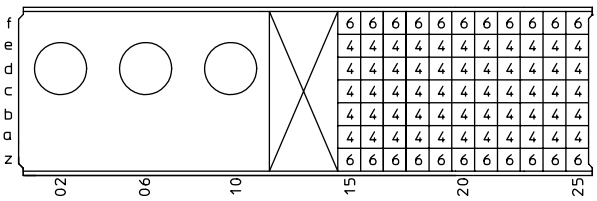




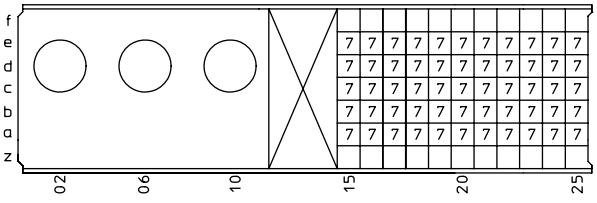
Standard loading patterns (seen from mating side)



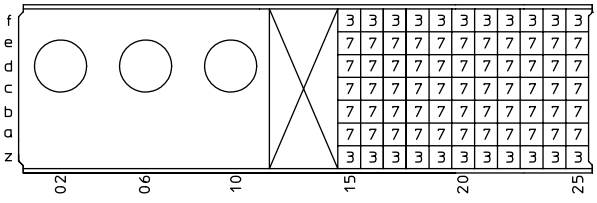
HM2P11PD5110N9



HM2P11PD5111N9



HM2P11PK5110GF

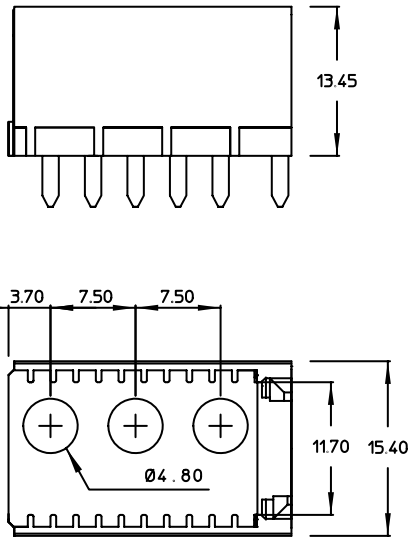


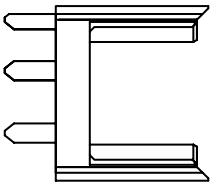
HM2P11PK5111GF

5 Row male hybrid housing for 3 DIN contacts : TYPE N

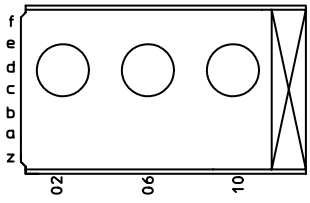
Description

- 5 Row male housing with 3 special cavities.
- Integrated area for guiding & polarization.
- 3 x 4.8 mm diameter cavities for coax, power or FO contacts conforming DIN 41626.
- Pre-assembled modules with press-fit power contacts.
- Board lay-out : see page 80.



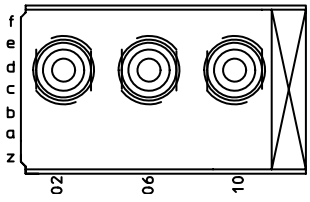


Empty housing :



HM2P12P1

Pre-assembled module with press-fit power contacts :

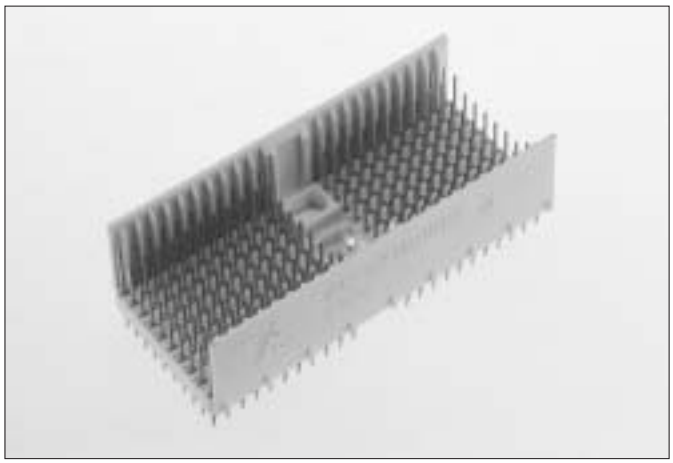


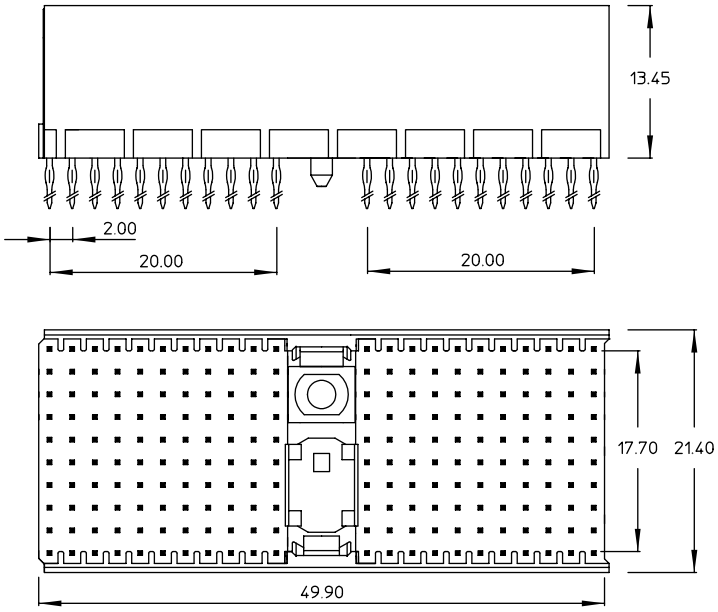
HM2A32PG5000

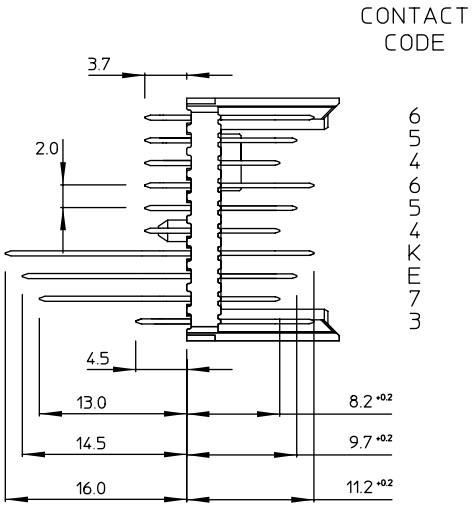
8+2 Row male signal straight press-fit-to-board connector : TYPE D

Description

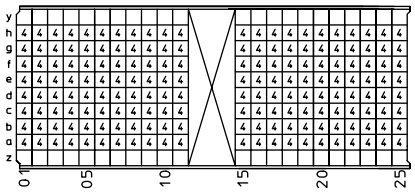
- 8 or 8+2 Row male header with 176 signal contacts.
- Integrated “MP” center for polarization, guiding and coding. (“MP” = multi purpose center)
- Additional guiding area, contact pin optional.
- Press - fit terminations.
- 3 Mating levels.
- Non - shielded and shielded versions.
- Customized loading arrangements : see page 5.
- Board lay-out : see page 80.



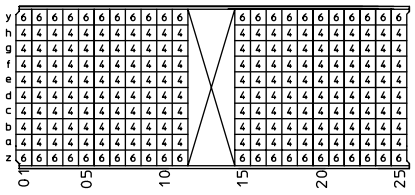




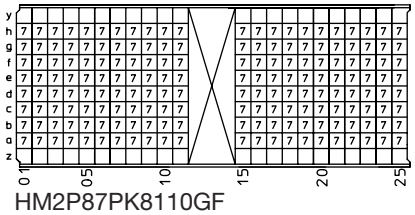
Standard loading patterns (seen from mating side)



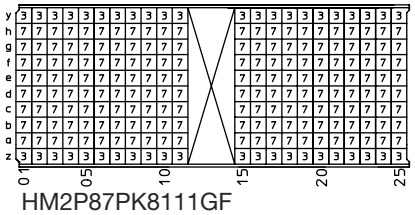
HM2P87PD8110N9



HM2P87PD8111N9



HM2P87PK8110GF



HM2P87PK8111GF