

ept

...ept

ideasproductionservice

Connectors

ept worldwide



We are represented
in 33 countries for
our clients.

We produce quality...

...in a place where others
enjoy their vacations.





- ✓ Connectors and processing technology
- ✓ Approximately 280 employees in Germany, 800 employees worldwide
- ✓ Worldwide sales network
- ✓ Decades of experience
- ✓ Development and construction
- ✓ Tool production and Assembly
- ✓ Quality adherence to DIN EN ISO 9001

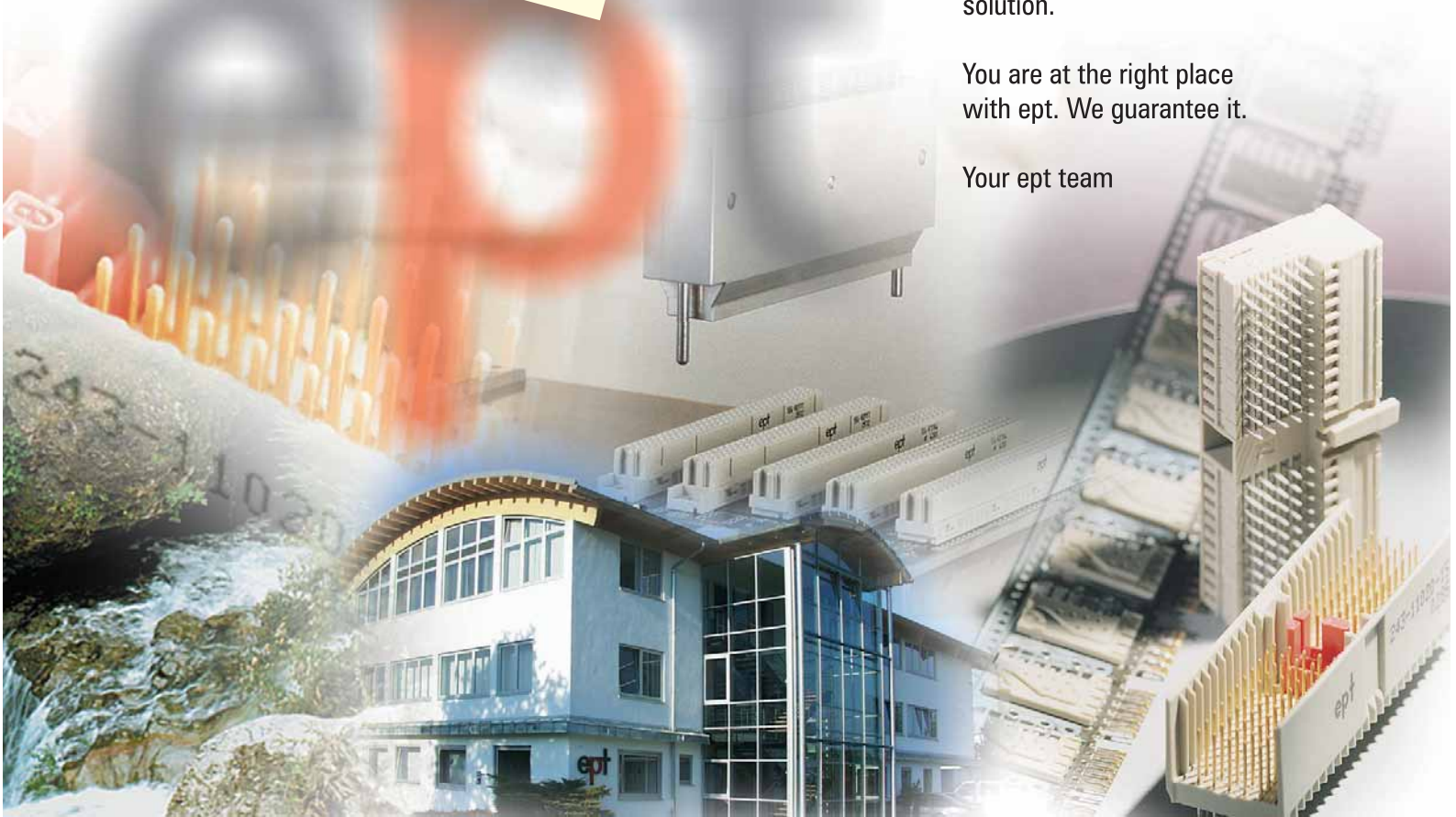
The name ept stands for complete problem solutions in the connector field.

Elements of pressfit and processing technology come from the same hand at ept. Technical competence and a high standard of quality paired with creativity and precision determine our products.

More than 25 years of experience in the area of pressfit technology gives you the security of receiving the optimal solution.

You are at the right place with ept. We guarantee it.

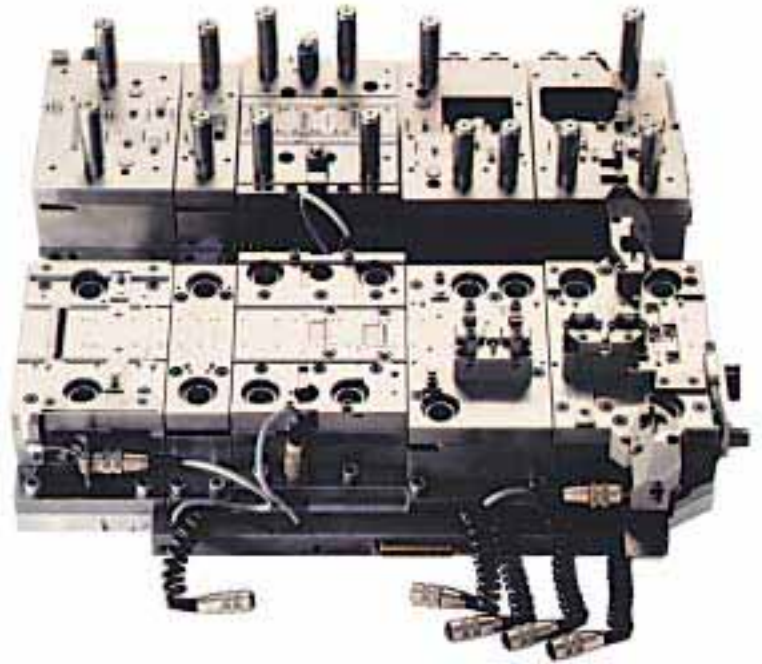
Your ept team



Decades of experience in the areas of

- *Developement*
- *Design*
- *Tooling*
- *Manufacturing*
- *Quality*

are a guarantee for high quality products.



1



2



3



4



5



6

- 1 *Wire cutting*
- 2 *Design of products and equipment*
- 3 *ept-plating line*
- 4 *hm 2.0 Production line*
- 5 *Production Stamping/Forming/Welding*
- 6 *Molding*

Technical Notes

Definition of Terms	1.6
Press-fit Technology	1.8
Tin Slivers and PCB warping	1.9
Hole diameter 0,85 mm	1.9
Through hole specifications for press-fit technology, PCB hole Ni/Au, PCB hole copper.....	1.10
PCB hole hal tin, PCB hole chem. tin	1.11

Hardmetric Connector System hm 2.0

Technical Notes	2.3
Electrical Characteristics	2.4
Coupling (Cross talk)	2.5
System modularity	2.6
Connectors Type A	2.8 - 2.10
Connectors Type B	2.12 - 2.13
Connectors Type B-22 (Compact PCI P2/P5)	2.14 - 2.15
Connectors Type B-19 (VME J0 and C-PCI P3)	2.16 - 2.17
Connectors Type C	2.18 - 2.19
Connectors Type AB-25	2.20 - 2.21
Connectors Type AB-22	2.22 - 2.23
Connectors Type AB-19	2.24 - 2.25
Connectors Type D	2.26 - 2.27
Connectors Type E	2.28 - 2.29
Connectors Type F	2.30 - 2.31
Connectors Type DE	2.32 - 2.33
Connectors Type L	2.34 - 2.35
Connectors Type M	2.36 - 2.37
Connectors Type N	2.38 - 2.39
Shrouds for Male Connectors Type A, B, B-22, B-19 and C	2.40
Shrouds for Male Connectors Type AB	2.41
Overview compactPCI Connectors	2.42
Coding Devices	2.44
Fax request	2.45 - 2.47

Connectors for Press fit Technology

Specifications	3.2
Pre-mating/late-mating male contact pin for Type B, C, R, D, E, F, G	3.6
Board-Lock	3.9
Keying without loss contacts	3.9
Switching Connectors (VME-Bus), switching function between adjacent pins in one row	3.11
Switching Connectors, switching function between pins in side by side rows	3.12
Female Connectors Type B, C with custom configuration for switching contacts.	3.13
Female Connectors Typ VME 64x	3.14
Connectors Type B, B/2, B/3	3.16 - 3.19
Connectors Type C	3.20 - 3.23
Female Connectors Type C, C/2, C/3 Flat Rock	3.24 - 3.25
Female Connectors Type M Flat Rock for Special Contacts acc. DIN 41626	3.26
Female Connectors Type M Flat Rock for Special Contacts in Press-fit Technology	3.28
Female Connectors Type M/2 and M/3	3.30
High Current Contacts	3.31
Connectors Type R, R/2, R/3	3.32 - 3.35
Male Connectors Type R with Keying	3.36
Female Connectors Type D	3.37
Female Connectors Type E	3.38
Female Connectors Type F	3.40
Female Connectors Type F low profile	3.41
Female Connectors Type G	3.42
Female Connectors Type G low profile	3.43

Female Connectors Type H7/F24 mixed pin low profile	3.44
Socket Strips	3.46
VarPol Female Connectors flat rock technology	3.47
VarPol PC/104 Female Connectors flat rock technology	3.48
PC/104 Plus Female Connectors flat rock technology	3.49
Straight headers, grid 2 mm	3.50
Shroud PC/104 Plus	3.51
VarPol straight headers	3.52
VarPol right angle headers	3.53
Power Terminal grid 5,08x7,62 mm	3.54
Power Terminal grid 5,08x10,16 mm	3.55
Spade Terminals	3.56
Shrouds for Type C and R	3.57

Connectors for Solder Technology

Connectors Type B, B/2, B/3	4.2 - 4.5
Connectors Type C, C/2, C/3	4.6 - 4.9
Connectors Type R, R/2, R/3	4.10 - 4.13
Connectors Type D	4.14 - 4.15
Connectors Type E	4.16 - 4.17
Connectors Type F	4.18 - 4.19
Female Connectors Type F low profile	4.20
Connectors Type G	4.22 - 4.23
Connectors Type H11	4.24 - 4.25
Connectors Type H15	4.26 - 4.27
Female Connectors Type H11 low profile	4.28
Female Connectors Type H15 low profile	4.29
Connectors Type H7/F24 mixed pin	4.30 - 4.31
Female Connectors Type H7/F24 low profile mixed pin	4.32
Female IDC Connectors Type B	4.34
Female IDC Connectors Type C	4.35

Assembly Tools

Insertion Tools for ept-hm 2.0 Connectors

Male Connectors Type A, B, B-22, B-19, C, D, E, F	5.2
Male Connectors Type AB-19, AB-22, AB-25, DE-25, Compact PCI, L, M, N	5.3
Flat Rock Tool for hm 2.0 Male Connectors, Support Block	5.4
Mounting and repair set for connector system hm 2.0	5.5
Shroud Equipping and Stripping Tool, Single Pin Extraction and Set Tool, Coding Key Set Tool	5.5

Insertion Tools for ept-Connectors

Male Connectors Type B, C, C-Flat Rock, Female Connectors Type B-, C-Flat Rock, PC/104	5.6
Female Connectors Type B, C, D, E, F, G, R, R Flat Rock	5.7
Male Connectors Type R, Female Connectors Type M, Power Terminals	5.8
Spade Terminals, VarPol Headers, VarPol Straight Headers Flat Rock	5.9

Support Tool for ept-Connectors

Support Block, Universal Support Block, B-, C-Female, R-Male Connectors	5.10
B-, C-Male Connectors, R-Female Connectors, M-Female Connectors, VarPol Straight Headers, Female Connectors, Connector Strips	5.11
PC/104 Female Connectors, PC/104 and PC/104 plus Female Connectors	5.12

Repair Tools for ept-Connectors

Ejector Tool for Type B, C, D, E, F, F-low profile, Support block for disassembly, Extraction Tool for short pins	5.13
Extraction Tool for Pins 13/17 mm, Extraction Tool for single pins, Insertion Tool for straight single pins	5.14
Keying Pliers, Tool for Lower Shield	5.15
Tool-Adaptor, Fixed head adaptor, Rotation Tool Adaptor, Quick Release Support	5.16
Quick Release Mounting, Alignment tool	5.17

Definition of Terms

Air Gap

The shortest straight line air distance between two conductors under voltage. The maximum voltage possible which these conductors may be subject to depends on the dielectric characteristic of the air.

Capacitance

Between two adjacent contacts or conductors which are separated by a dielectric.

Contact Force

Force which the female contacts develop on the male contact.

Contact resistance

The resistance which occurs at the point of contact between a female contact and the male connector pin.

Contact spring

The elastic contact of a connector pin to the female contacts.

Connection Techniques

Process for connection of electronic components. ie. WireWrap, Crimp, Clamp, Press-fit, IDC, throughhole, SMD and Solder contact.

Creep Distance

The shortest distance between two current carrying conductors on the surface of the insulator.

Creep Current

The current which flows along the surface of the insulator between two conductors under voltage load. The likelihood of this taking place is increased by dust, moisture or other foreign materials which can lead to lowered resistance between the conductor pair.

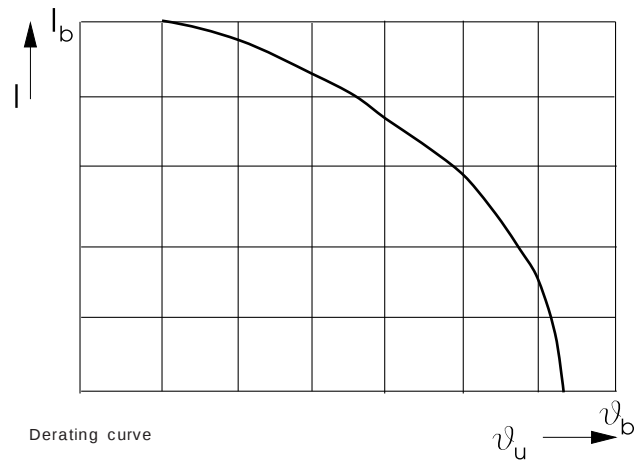
Crimp Contact

According to DIN 41613, part 3. With the help of a crimp tool the connection between a wire and a crimp contact is deformed so that a gas-tight contact is made. For crimping it is usual to use one or more wire conductors.

Current Limit

Maximum acceptable operating current I_b which can flow over a mated pair of connector contacts. The acceptable thermal load of the materials limits the current load which is allowed for the contacts and the insulator. Included in this calculation is the ambient temperature and the temperature rise generated by the current.

The method for measuring current carrying capacity is set forth in DIN 41640 part 3. This process calls for the measurement of the temperature at the warmest point of the component and the ambient temperature at various current levels.



Dual Contact

A female contact with two opposing contact leaves.

Dynamic specifications and requirements

Term for mechanical requirements such as acceleration vibration and shock.

Electromagnetic Compatibility

The disturbances which arise from electromagnetic interference can be reduced by shielding the Connector.

First mate last break contact (premate)

These are available as protection for sensitive devices which require separation before or after the other contacts, such as signal pins.

Flat Cable Connector

Connectors for IDC technique for flat cable with round wires.

Grid Spacing

This is the spacing between drilled through holes in a printed circuit card.

Inverted Connector

Indirect connector system where the female contact is not on the powered side of the module (Backplane), but rather on the daughter card.

Insulation Resistance

Resistance of the insulating part between two conductors. This should be as high as possible. Test and measurement protocol according to DIN 41640 Part 7.

Insertion and extraction force

The force required to insert or extract a connector. As a result of the need to open the female contact, the insertion force is generally greater than the extraction force. The equation for the extraction force of a connector is as follows.

$$\text{Extraction force} = n \cdot F \cdot \mu$$

- n number of friction points
- F the contact force
- μ friction factor

Since it is primarily the friction factor which creates the largest tolerances, (ie, oiled or dry contact surfaces) it is evident that for multiple contact connectors there will be the largest differences in insertion and extraction forces. Listed values for insertion extraction forces are the maximum which should be taken into account in development of electronic packaging.

Keying

Is a mechanical means of polarizing connectors in order to prevent similar connectors from being mated. This is necessary when 2 or more similar connectors must be connected to a backplane or other electronic module which requires that the element being connected is unique for a particular location.

Limiting Temperatures

The upper and lower temperature at which the materials used for making a connector are not damaged. The operating temperature range lies between these limits.

Life Cycle

The life cycle of a connector is the number of times insertion and extraction can occur before the plated surface is removed by friction.

Nominal Current

This is the current which can be carried constantly for a test class in a closed environment.

Operating Voltage

The Voltage which a particular contact will be subject to in long term operation.

Operating Temperature Range

The range between upper and lower long term temperature which can be acceptable to the application. The upper temperature range is the sum of ambient temperature and the heat generated by the component.

Press-fit Connection

According to DIN 41611 part 5 and EN 60352-5: The press-fit connection which is made of elastic deformable or massive (solid) pins into the plated through holes of the PCB. At the point of contact between the pin and the through hole plating a gas tight connection ensues.

Press-fit Pin

A metal pin with a specified area for pressing into a plated through hole without the requirement of further soldering. There are two types of press-fit pins.

- Solid pin. The forces required for a solid mechanical contact between pin and hole are generated by the deformation of the drilled through hole.
- Compliant pin. The forces required for a good contact between pin and through hole are generated by the deformation of the press-fit section of the pin.

Penetration Contact (Insulation Displacement Contact)

According to DIN 41611 part 8. A solderfree electrical contact is created when specific contact elements (ie, lances, points and blades with sharp edges) penetrate the insulation layer to make permanent gas tight contact with the conductor underneath.

Quality Class

Specifications and requirements according to IEC 60603-2, IEC 60352-5 and IEC 61076-4-101 for life cycle of connectors according to expected end use environment. There are three divisions as follows:

	IEC 60603-2 IEC 60352-5	IEC 61076-4-101 (hm 2.0)
Quality Class I/1	500	500
Quality Class II/2	400	250
Quality Class III/3	50	50

Termination Resistance

According to DIN 41611 part 4, 5 and 6. The resistance across a mated pair of connector pins which is determined according to specified test and measurement protocol. The mated pair resistance is a combination of contact resistance and resistance from the current carrier (wire, Pin). If nothing else is specified, these values are to be taken as the „Mated pair resistance, millivolts method“.

Tin Sliver Creation

The forcing out from the through hole of excessive tin during the insertion of a press-fit pin. This can happen if there is excessive tin created by the hot air leveling of the PCB.

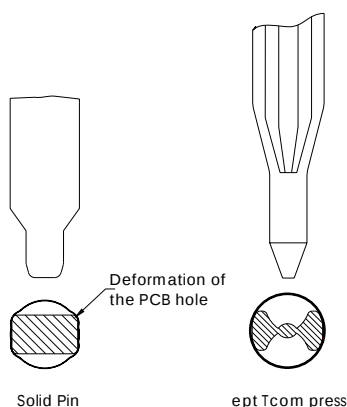
Press-fit Technology

Basic Technology

A press-fit connection is made, as the name implies, through the pressing in of a contact pin into a PCB through hole. The important consideration here is that the cross section of the pin is greater than the diameter of the PCB hole. This difference in pin cross section and hole diameter results in a deformation of either the PCB hole or the cross section of the pin during the insertion process.

There are two major types of press-fit sections:

- A solid pin which does not deform in the insertion process.
- A compliant pin which compresses as a result of insertion into the PCB through hole.



The compliant pin technology for press-fit insertion is the clear choice of the engineering community for achieving a reliable press-fit contact. Compliant pin technology has a number of important advantages over solid pins:

- reduction in size of the press-fit section makes less demands on the PCB through hole.
- greater tolerances can be accepted for the plated drilled-through hole.
- lower insertion forces are required, resulting in fewer undesirable side effects.
- multiple press in cycles into the same through hole are possible.

A comparison of solder versus press-fit technology

In comparison to standard soldering methods, press-fit technology exhibits a number of advantages:

- no thermal stress on the PCB.
- no fumes, gases or cleaning fluids which may reduce the contact reliability of the connector.
- no cold solder joints.
- no shorts as a result of solder bridging.
- mechanical mounting of the connector by means of the press-fit joint means the elimination of the need for mounting screws.

- long connector pins can be used for contacts from the backside of the PCB since there will be no solder build up on these pins.
- well defined impedance of the contact. (good high frequency properties)
- fast, cost effective assembly of the connector onto the PCB or Backplane.
- complete reparability in that connectors or single contacts can be replaced easily.
- environmentally friendly since PCBs with press-fit connectors do not need to be washed.
- recycling of connectors can be made easy by disassembly of connector and PCB, for the recovery of gold.

An important but often underrated positive aspect of press-fit technology versus soldering is the advantage that press-fit technology has with respect to the efficient and effective manufacturing of Backplane and PCB assemblies. Studies at many companies have shown that the problems which arise from solder technology are often not evaluated correctly. An economic comparison between press-fit technology and solder technology shows that the efficiencies achieved with press-fit assembly of connectors and components are substantial in comparison with the solder process.

Press-fit Technology and SMT

SMT and press-fit technology are the basis for a rational, cost effective and high quality assembly of components to printed circuit cards and backplanes.

After the assembly of components to PCBs by means of reflow soldering, connector sockets and pins can be pressed into the through holes, which are unaffected by the reflow solder process.

Specifications and Requirements of press-fit cross sections and PCB through holes

The ept press-fit sections - solid and compliant pins - meet the requirements of the DIN 41612 Part 5 and IEC 60352-5 specifications. Printed Circuit Card through holes must meet these specifications for press-fit insertion of pins.

Tcom press-fit sections for every need

A well designed modern press-fit section can meet the requirements of a wide variety of applications.

Among these are:

- Avoidance of tin slivers on PCBs which are produced with hot air leveled plated through holes.
- Prevention of the warping of Backplanes. (banana effect)
- Variations of through hole tolerances.
- Functionability even for Ni/Au or pure copper plating.

Tin Slivers and PCB warping

Excessive buildup of tin inside the plated through holes as a result of hot air leveling should not be allowed to create tin slivers in the press-fit insertion process.

For this reason ept has developed a shorter press-fit section which allows excessive tin buildup to remain inside the through hole.

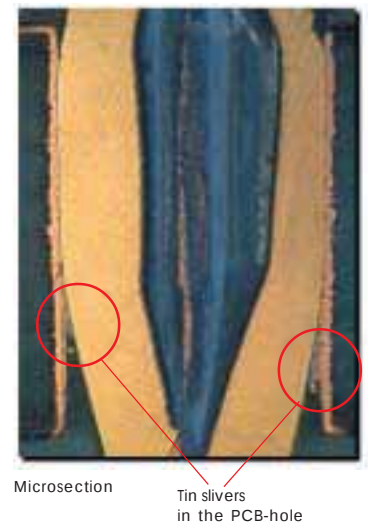
The warping of a printed circuit board can also be prevented by selection of a suitable length press-fit section compatible to the PCB thickness.

ept supplies 3 variations of the Tcom press-fit section for different PCB thicknesses.

Please select the correct ordering information from the following table.

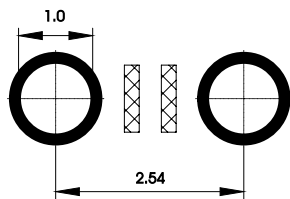
Table for ordering

Type	PCB-thickness 1,5 ... 2,0 mm	PCB-thickness 2,0 ... 2,8 mm	PCB-thickness > 2,8 mm
B, B/2, B/3 (Female)	102-xxxxx-01	102-xxxxx-02	102-xxxxx-03
C, C/2, C/3 (Female)	104-xxxxx-01	104-xxxxx-02	104-xxxxx-03

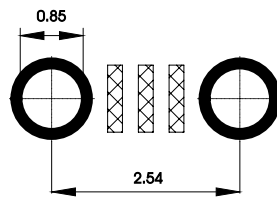


Hole diameter 0,85 mm

In addition to the 1 mm standard through hole for the connectors type B and C, ept also supplies a smaller cross section Tcom press-fit section for 0,85 mm dia holes. This provides more space between two through hole contacts for the addition of more traces with standard PCB manufacturing techniques, allowing for a potential reduction in the number of layers required for a particular configuration, or increase in overall circuit density for a product.



PCB-hole 1,0 mm



PCB-hole 0,85 mm



Tcom 1,0 mm / 0,85 mm

Other sizes of pressfit section are possible according to customer request. Tests have been performed for press-fit sections for holes as small as 0,6 mm dia. (For bare copper)

Table for ordering Tcom press for 0,85 mm dia through holes

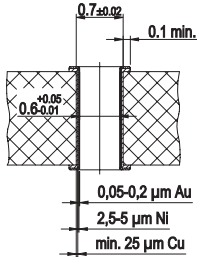
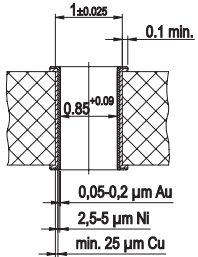
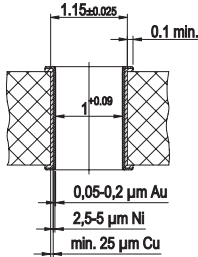
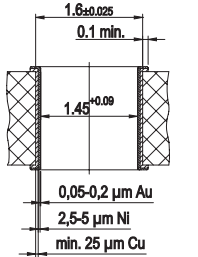
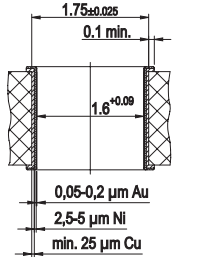
Type	Part Numbers
B, B/2, B/3 (Female)	002-xxxxx-xx
C, C/2, C/3 (Female)	004-xxxxx-xx

Through hole specifications for press-fit technology

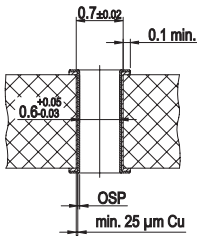
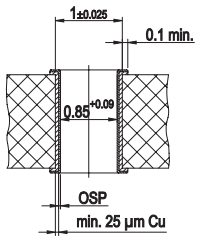
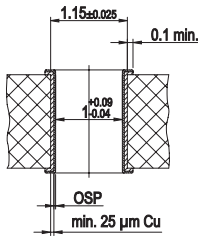
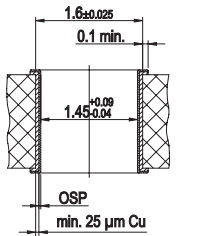
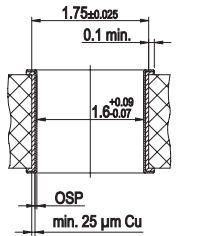
Continued applications of SMT and concurrent changes in PCB surfaces set new requirements for press-fit technology.

ept supplies press-fit sections for all new PCB variations..

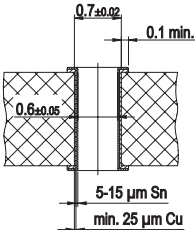
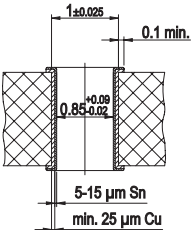
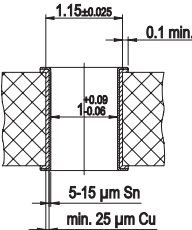
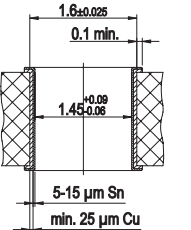
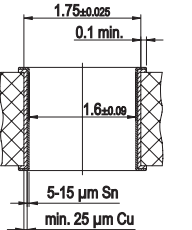
PCB hole Ni/Au

Hole	0,6 mm	0,85 mm	1,0 mm	1,45 mm	1,6 mm
Bore Hole	0,7 ±0,02 mm	1,0 ±0,025 mm	1,15 ±0,025 mm	1,6 ±0,025 mm	1,75 ±0,025 mm
Cu	min. 25 µm	min. 25 µm	min. 25 µm	min. 25 µm	min. 25 µm
Ni	2,5-5 µm	2,5-5 µm	2,5-5 µm	2,5-5 µm	2,5-5 µm
Au (chem./galv.)	0,05-0,2 µm	0,05-0,2 µm	0,05-0,2 µm	0,05-0,2 µm	0,05-0,2 µm
Plated-Through Hole	0,6 ^{+0,05} / _{-0,01} mm	0,85 ^{+0,09} / _{-0,00} mm	1,0 ^{+0,09} / _{-0,00} mm	1,45 ^{+0,09} / _{-0,00} mm	1,6 ^{+0,09} / _{-0,00} mm
					

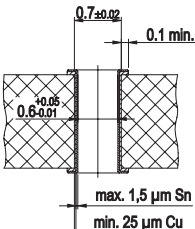
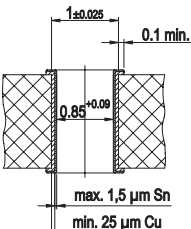
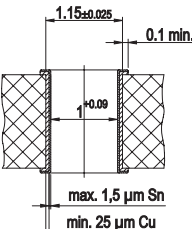
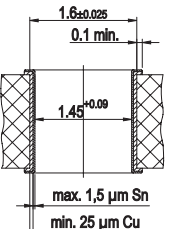
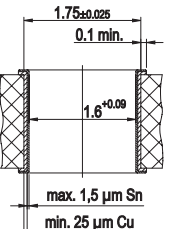
PCB hole copper

Hole	0,6 mm	0,85 mm	1,0 mm	1,45 mm	1,6 mm
Bore Hole	0,7 ±0,02 mm	1,0 ±0,025 mm	1,15 ±0,025 mm	1,6 ±0,025 mm	1,75 ±0,025 mm
Cu	min. 25 µm	min. 25 µm	min. 25 µm	min. 25 µm	min. 25 µm
OSP	OSP = Organic Solderability Preservatives / organische Deckschicht zur Kupferkonservierung, z.B. GLICOAT-SMD (F2) mit 0,12-0,15µm				
Plated-Through Hole	0,6 ^{+0,05} / _{-0,03} mm	0,85 ^{+0,09} / _{-0,00} mm	1,0 ^{+0,09} / _{-0,04} mm	1,45 ^{+0,09} / _{-0,04} mm	1,6 ^{+0,09} / _{-0,07} mm
					

PCB hole hal tin

Hole	0,6 mm	0,85 mm	1,0 mm	1,45 mm	1,6 mm
Bore Hole	0,7 ±0,02 mm	1,0 ±0,025 mm	1,15 ±0,025 mm	1,6 ±0,025 mm	1,75 ±0,025 mm
Cu	min. 25 µm	min. 25 µm	min. 25 µm	min. 25 µm	min. 25 µm
galv./HAL Sn	5-15 µm	5-15 µm	5-15 µm	5-15 µm	5-15 µm
Plated-Through Hole	0,6 ±0,05 mm	0,85 ^{+0,09} _{-0,02} mm	1,0 ^{+0,09} _{-0,06} mm	1,45 ^{+0,09} _{-0,06} mm	1,6 ±0,09 mm
					

PCB hole chem. tin

Hole	0,6 mm	0,85 mm	1,0 mm	1,45 mm	1,6 mm
Bore Hole	0,7 ±0,02 mm	1,0 ±0,025 mm	1,15 ±0,025 mm	1,6 ±0,025 mm	1,75 ±0,025 mm
Cu	min. 25 µm	min. 25 µm	min. 25 µm	min. 25 µm	min. 25 µm
chem. Sn	max. 1,5 µm	max. 1,5 µm	max. 1,5 µm	max. 1,5 µm	max. 1,5 µm
Plated-Through Hole	0,6 ^{+0,05} _{-0,01} mm	0,85 ^{+0,09} _{-0,00} mm	1,0 ^{+0,09} _{-0,00} mm	1,45 ^{+0,09} _{-0,00} mm	1,6 ^{+0,09} _{-0,00} mm
					

ept

the better connection



hm 2.0 hardmetric

Definition of Terms

Connector according to IEC 61076-4-101

The hardmetric connector system ept-hm 2.0 was developed according to the international standard IEC 61076-4-101. As a result, a worldwide standard for the combination of PCBs is safeguarded by multicontact plug-and-socket connectors for customers.

PCBs can be exchanged without problems from system to system. Important parameters like fixing, shielding and coding remain compatible to all applications.

The spacing

The ept-hm 2.0 connectors have been developed with a spacing of 2 mm between contacts. These connectors are modular and therefore can be stacked together without interrupting the continuity of the 2 mm design. No space is wasted within a row of connectors.

Module stacking

To improve stacking and to avoid accidental reversal of connectors the end of the housings engage the adjacent connector to insure exact positioning onto the PCB board and give the modules the necessary support.

Coding

In order to avoid accidental plug in among PC boards the IEC 61076-4-101 standard provides protection through coding. Coding keys are easily hand inserted into the multifunction block of the connector module A, L and M. The pins are color coded for fast visual recognition.

Multifunction block

The modules A, L, M and compact PCI are equipped with a multifunction block. The coding devices, according to the IEC standard, can be added to the multifunction block. The guides guaranty the correct mating and prohibit accidental reversal of the male and female connectors.

That coding devices may be assembled by a single plug and pulling tool and/or again removed.

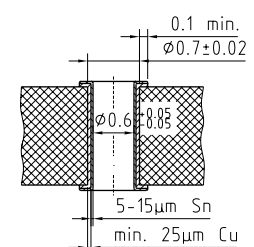
Contact length of the rear and front mating area

ept offers 3 different lengths for the front mating area and 4 lengths for the rear mating area for the hm 2.0 male connectors. Different contact lengths are required for signal and ground contacts to establish first make and last break features.

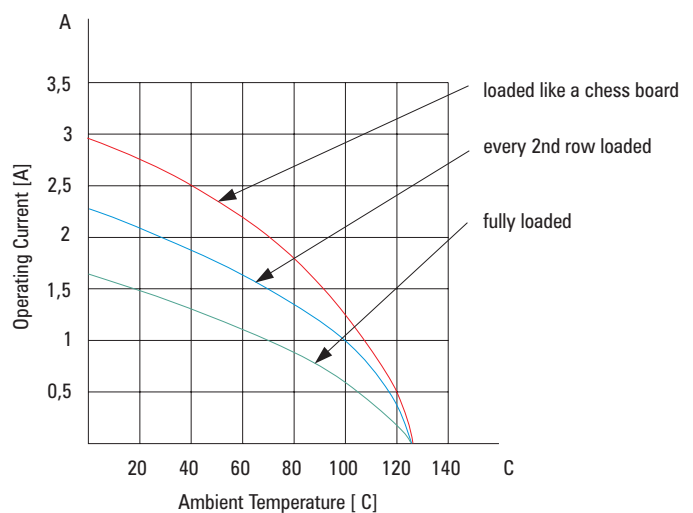
The long contacts with 11,25 mm are predominantly used for the shielding rows z and f.

Thru hole specification of the PCB

Throughplated holes for signal contacts and shieldings in press-fit techniques.

Hole Ø	0,6 mm	
Drillhole	0,68 - 0,72 mm	
Cu	min. 25 µm	
Sn	5 - 15 µm	
Plated through hole	0,55 - 0,65 mm	

Derating Diagram



Technical Notes

Electrical and mechanical data

Spacing		2 mm
Temperature range		- 55°C bis +125°C
Mechanical durability		> 250 Mating Cycles
Housing		Polyester Glass filled acc. UL 94V-0
Contact resistance acc. to IEC 512-5		max. 20mΩ
Contact material	Male contact	Bronze
	Female contact	Bronze
Male and female contact surface		Au over PdNi over Ni
Insulation resistance acc. IEC 512-5	Contact/Contact	min. 10 ⁴ MΩ
	Contact/Shield	min. 10 ⁴ MΩ
Insertion force per pin	Contact	max. 0,75 N
	Shield	max. 1 N
Extraction force per pin	Contact	min. 0,15 N
	Shield	min. 0,15 N

Test voltage

		fully loaded	every 2nd position	Chessboard
Row a, c, e Row b, d	within row	750 V _{eff}	1500 V _{eff}	--
	between rows	1500 V _{eff}	1500 V _{eff}	--
Row a, b, c Row a, b, c, d Row a, b, c, d, e	within row	750 V _{eff}	1500 V _{eff}	1500 V _{eff}
	between rows	750 V _{eff}	750 V _{eff}	1200 V _{eff}

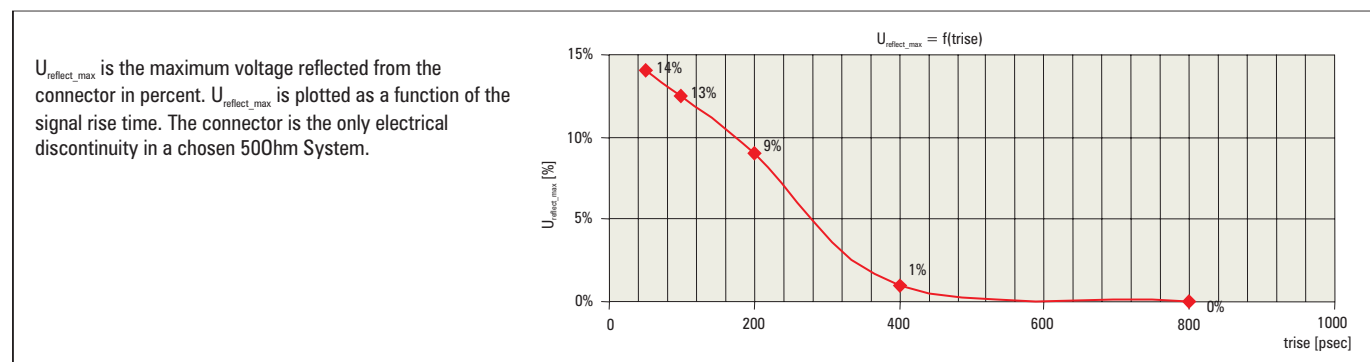
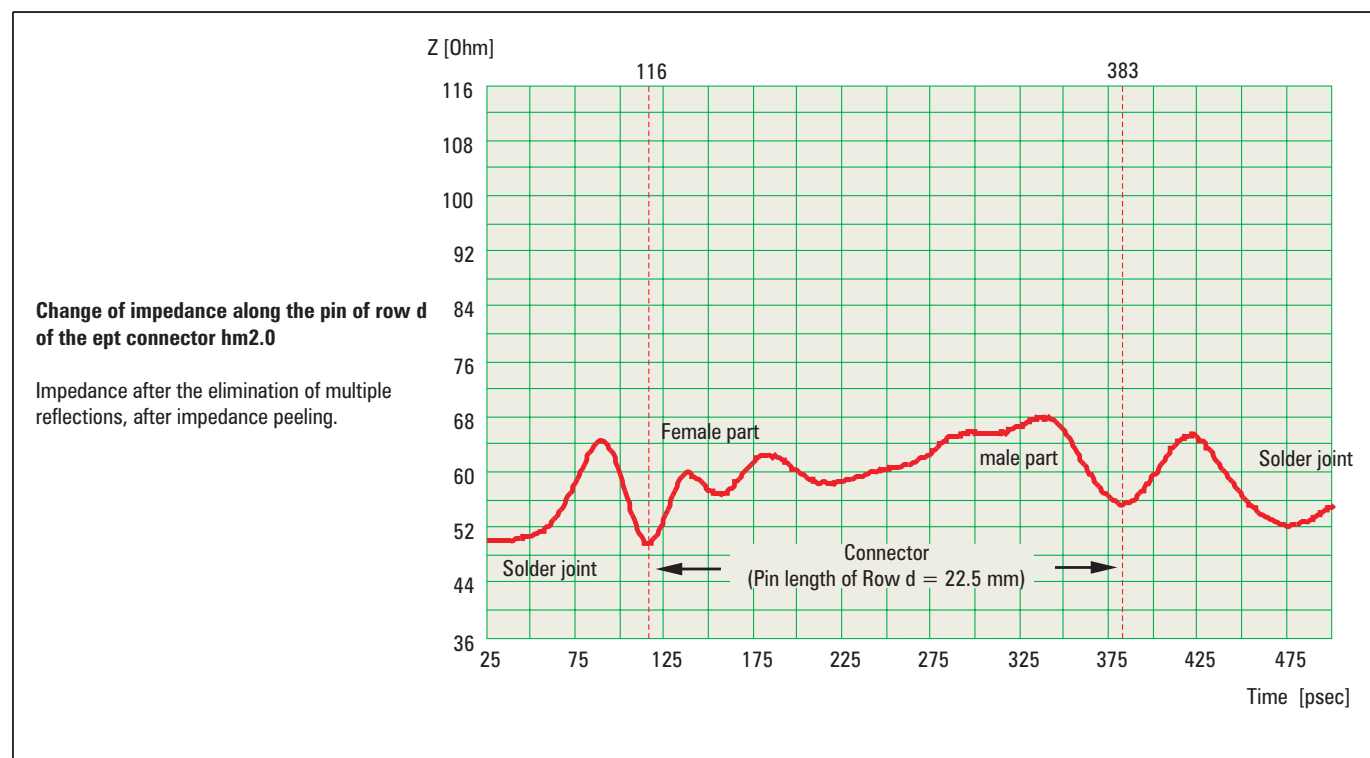
Creepage- and air gaps

		fully loaded		every 2nd position		Chessboard	
		Male connector	Modules Female connector	Backplane Male connector	Modules Female connector	Backplane Male connector	Modules Female connector
Row a, c, e Row b, d	within row	0,8 mm	0,6 mm	2,5 mm	2,5 mm	--	--
	between rows	2,5 mm	2,5 mm	2,5 mm	2,5 mm	--	--
Row a, b, c Row a, b, c, d Row a, b, c, d, e	within row	0,8 mm	0,6 mm	2,5 mm	2,5 mm	2,5 mm	2,5 mm
	between rows	0,8 mm	0,6 mm	0,8 mm	0,6 mm	1,5 mm	1,2 mm

Electrical Characteristics

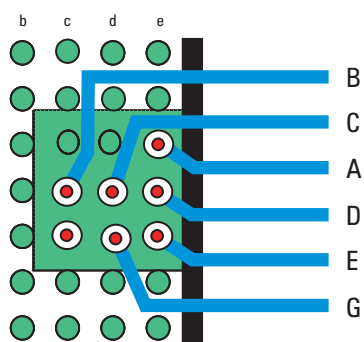
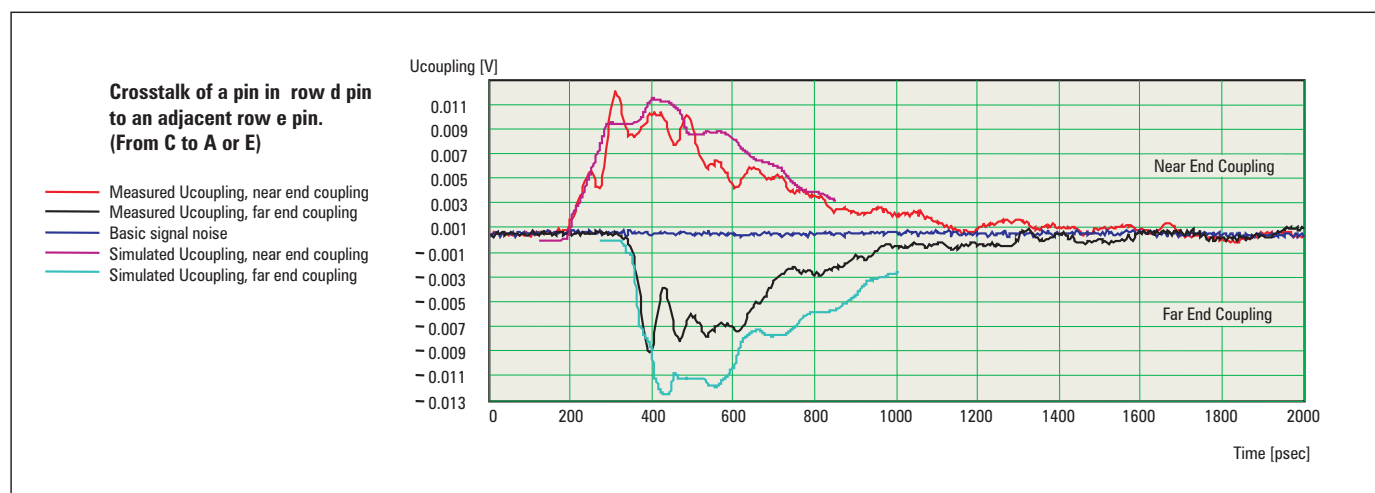
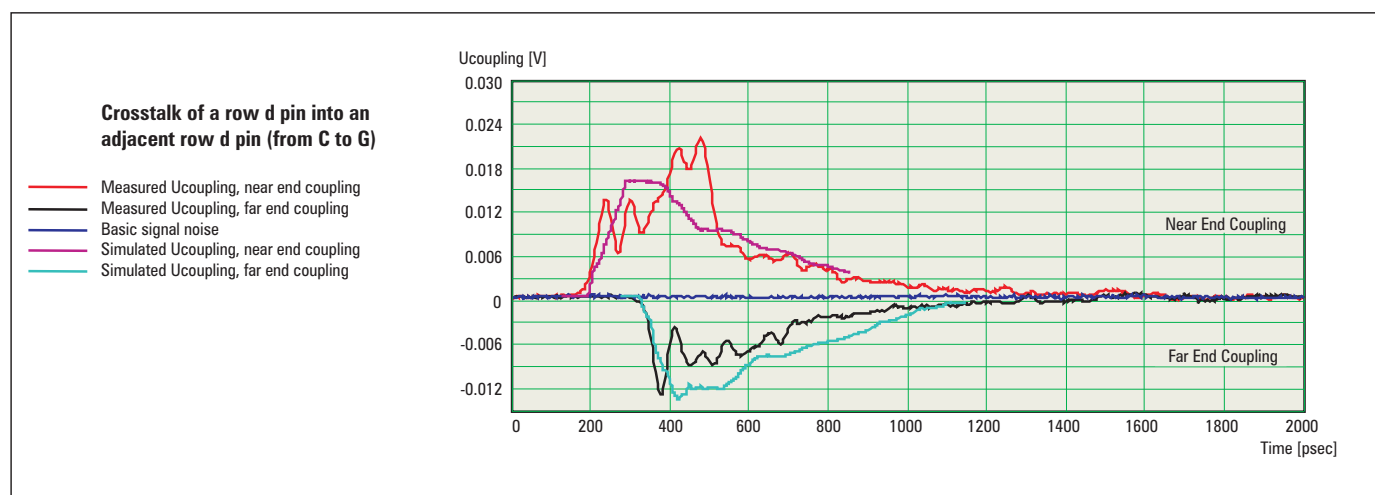
The connector system ept hm 2.0 was specially designed for high data rates. Below are a few examples of the HF characteristics.

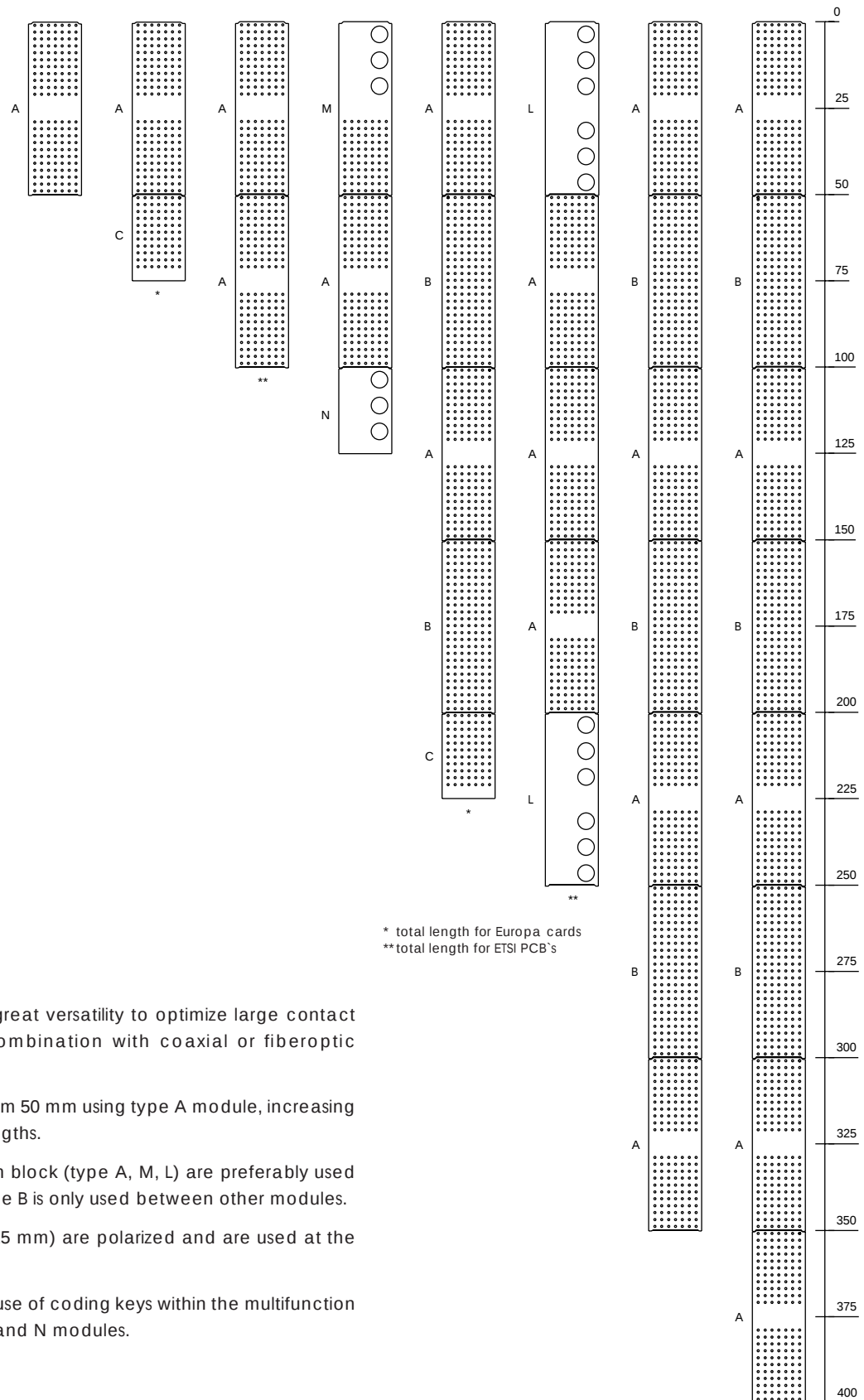
A spice model is available for simulations during system design. The simulation model was verified with TDR measurements.



Coupling (Cross talk)

The near end and far end coupling was measured and simulated for different arrangements. A 200 mV signal with a rise time of 25 psec was used.





System modularity

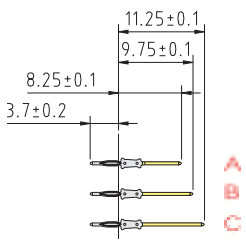
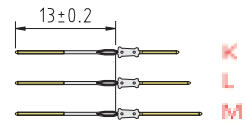
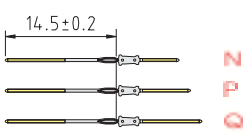
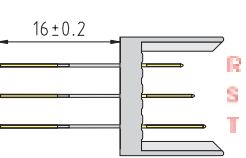
ept-hm 2.0 modules offer a great versatility to optimize large contact densities. Especially the combination with coaxial or fiberoptic connections.

Stacking can be arranged from 50 mm using type A module, increasing in 25 mm steps to required lengths.

Connectors with multifunction block (type A, M, L) are preferably used at the top of any column. Type B is only used between other modules.

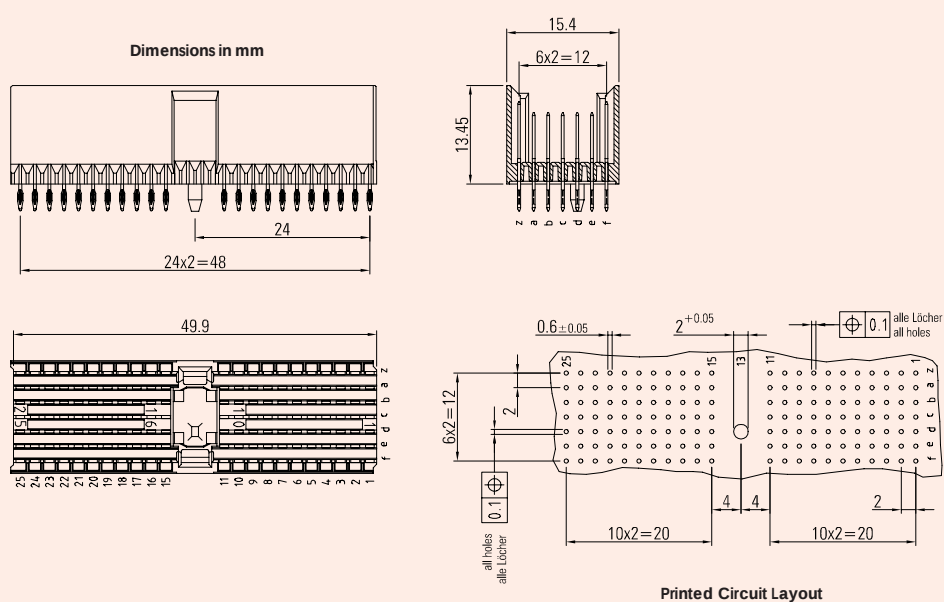
The modules type C and N (25 mm) are polarized and are used at the bottom end of the columns.

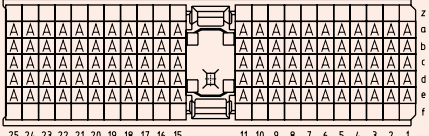
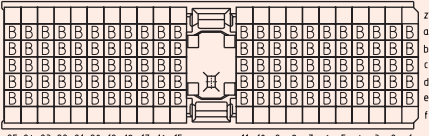
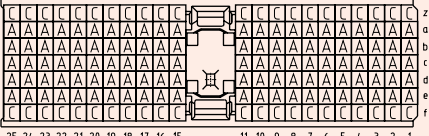
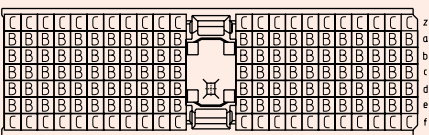
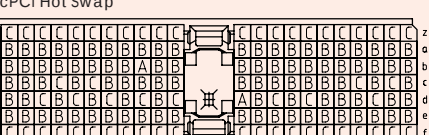
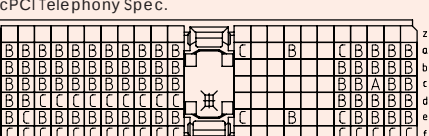
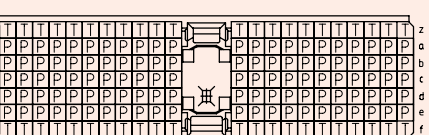
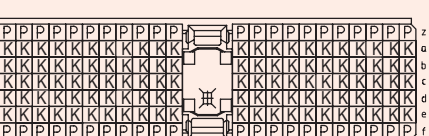
Correct mating is assured by use of coding keys within the multifunction block and by use of type C and N modules.

Dimensions of Contacts	Contact	Options	Front mating	Used for
	A	without mating area	8,25±0,1	signal contact
	B		9,75±0,1	signal contact
	C		11,25±0,1	shielding
	K	with mating area 13 mm	8,25±0,1	signal contact
	L		9,75±0,1	signal contact
	M		11,25±0,1	shielding
	N	with mating area 14,5 mm	8,25±0,1	signal contact
	P		9,75±0,1	signal contact
	Q		11,25±0,1	shielding
	R	with mating area 16 mm	8,25±0,1	signal contact
	S		9,75±0,1	signal contact
	T		11,25±0,1	shielding



Male Connectors Type A (Compact PCI P1/P4)



Assembly Drawing	No. of Positions	Row	Type	Pin length	Part Numbers
	110	z a b c d e f	- A A A A A -	-/- 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 -/-	243-11010-15
	110	z a b c d e f	- B B B B B -	-/- 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 -/-	243-11020-15
	154	z a b c d e f	C A A A A A C	11,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 11,25/3,7	243-11310-15
	154	z a b c d e f	C B B B B B C	11,25/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 11,25/3,7	243-11320-15
cPCI Hot Swap 	154	z a b c d e f	C B * * * B C	11,25/3,7 9,75/3,7 * * * 9,75/3,7 11,25/3,7	243-11322-15
cPCI Telephony Spec. 	100	z a b c d e f	- * * * * * *	- * * * * * *	243-11323-15
	154	z a b c d e f	T P P P P P T	11,25/16,0 9,75/14,5 9,75/14,5 9,75/14,5 9,75/14,5 9,75/14,5 11,25/16,0	243-11360-15
	154	z a b c d e f	P K K K K K P	9,75/14,5 8,25/13,0 8,25/13,0 8,25/13,0 8,25/13,0 8,25/13,0 11,25/14,5	243-11735-15

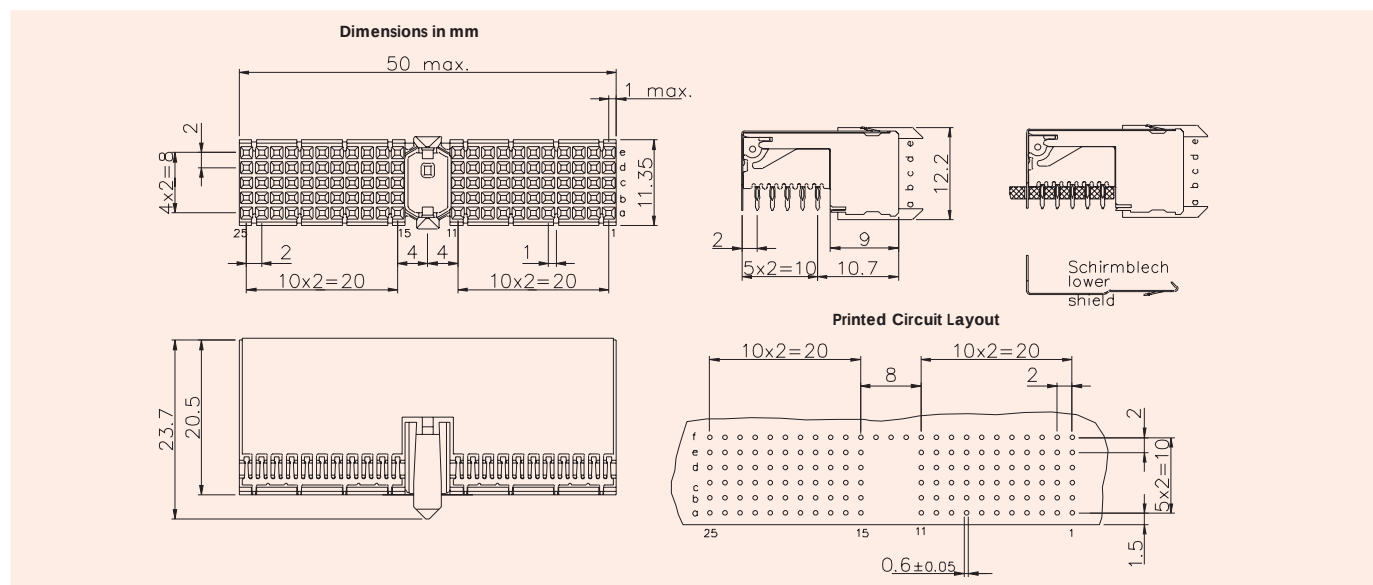
* Attention: Please consider the different pin length in the assembly drawing.

Note: PCB thickness 1,6 - 2,8 mm Part No. XXX-XXXX-05

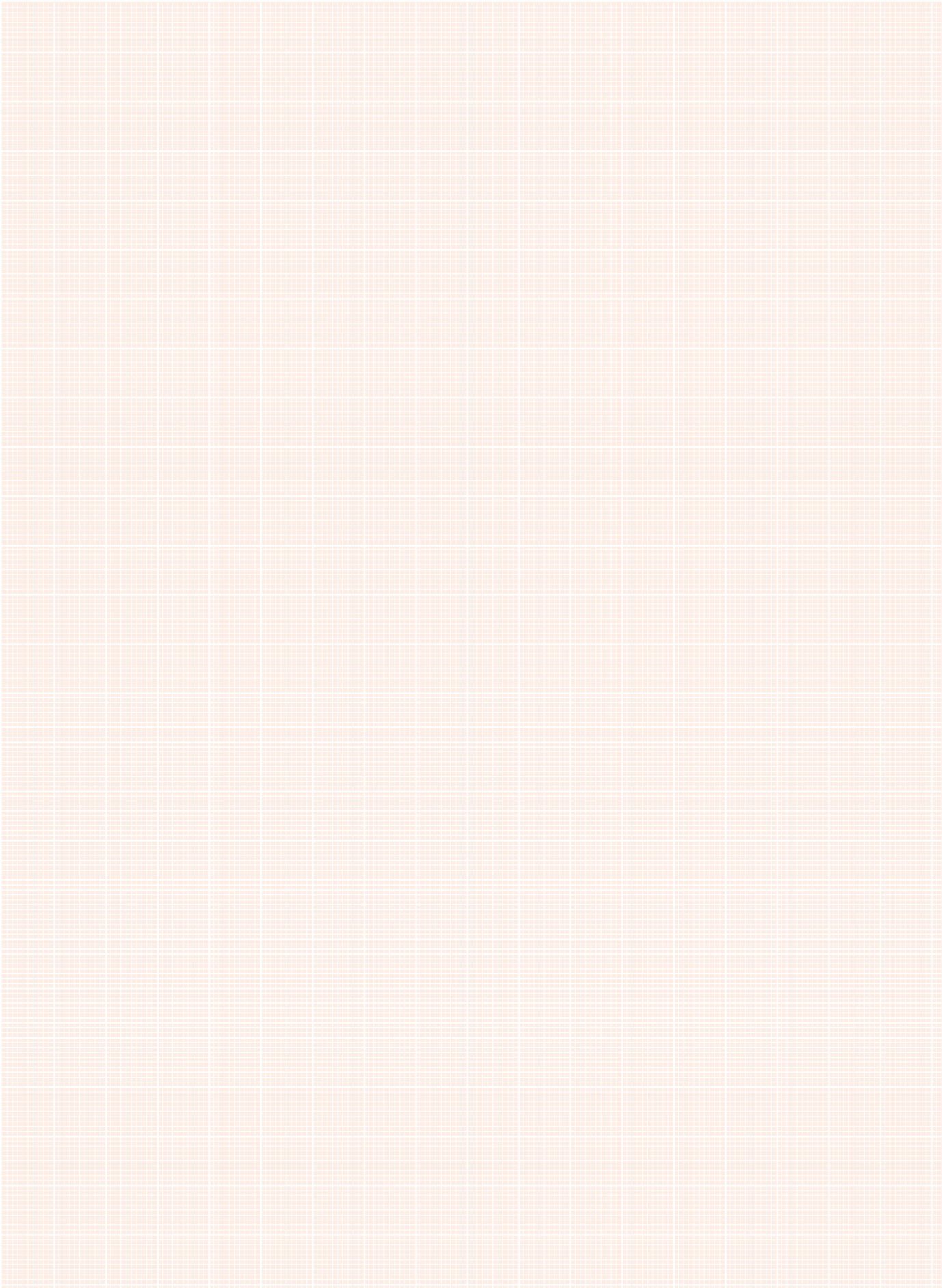
Insertion Tool: Part No. 884-700-W25



Female Connectors Type A

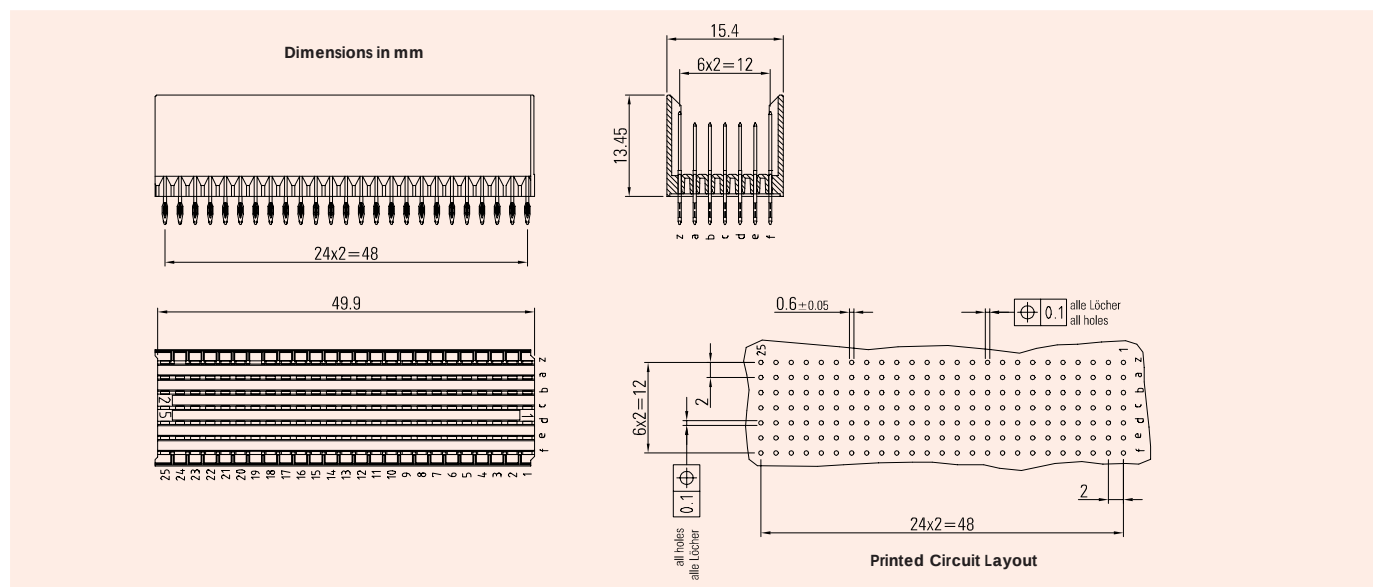


Type	No. of Positions	Part Numbers
without shielding	110	244-11000-15
with shielding	110	244-11300-15
with shielding (cPCI Telephony Spec.)	90	244-11305-15
lower shield		244-11600-1
THTR without shielding	110	244-11000-25
THTR with shielding	110	244-11300-25





Male Connectors Type B



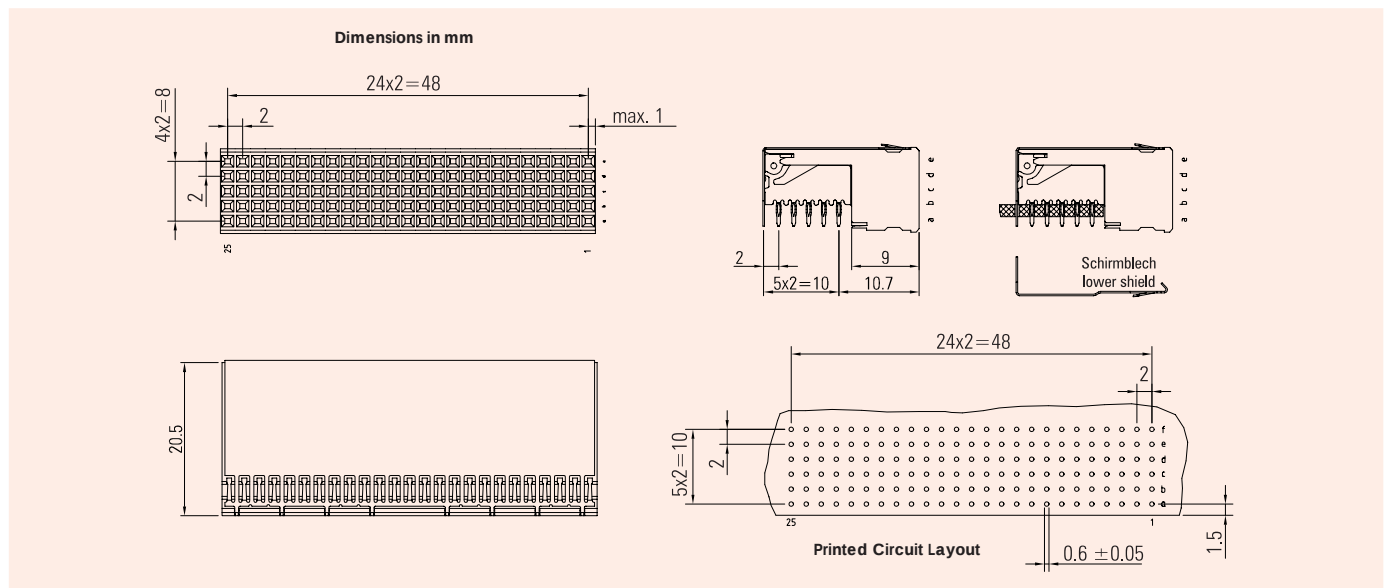
Note: PCB thickness 1,6 - 2,8 mm Part No. XXX-XXXXX-05

Insertion Tool: Part No. 884-701-W25

Assembly Drawing	No. of Positions	Row	Type	Pin length	Part Numbers
	125	z a b c d e f	— A A A A A —	—/ 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 —/—	243-21010-15
	125	z a b c d e f	— B B B B B —	—/ 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 —/—	243-21020-15
	175	z a b c d e f	C A A A A A C	11,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 11,25/3,7	243-21310-15
	175	z a b c d e f	C B B B B B C	11,25/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 11,25/3,7	243-21320-15



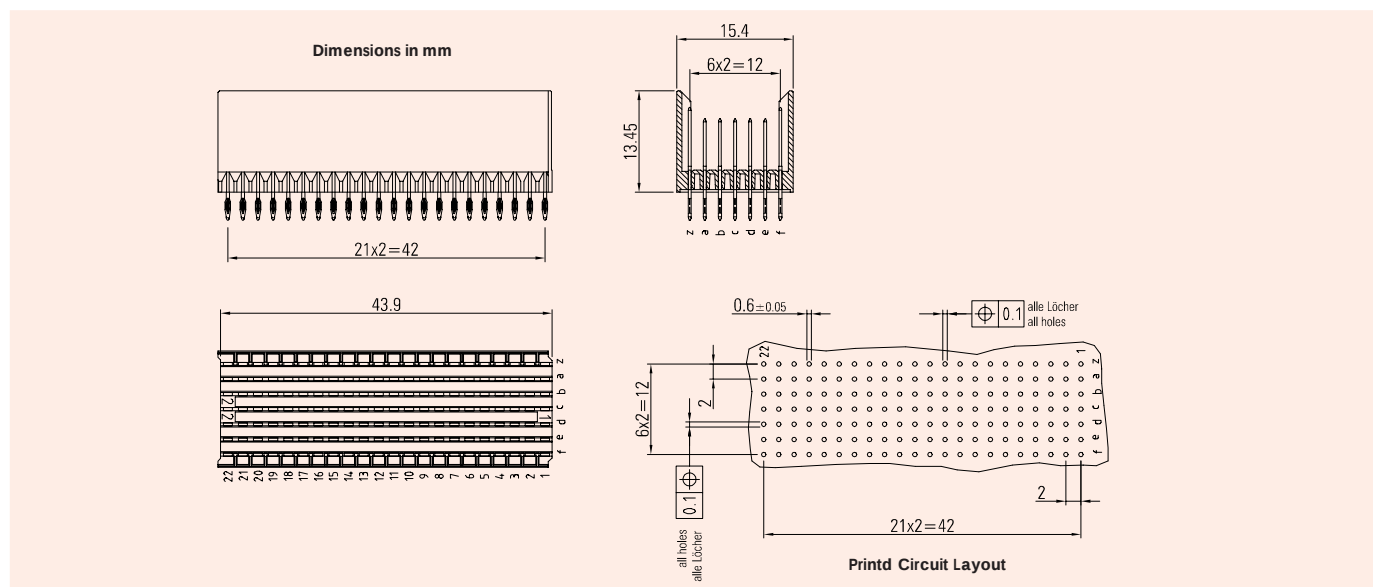
Female Connectors Type B



Type	No. of Positions	Part Numbers
without shielding	125	244-21000-15
with shielding	125	244-21300-15
lower shield		244-21600-1
THTR without shielding	125	244-21000-25
THTR with shielding	125	244-21300-25

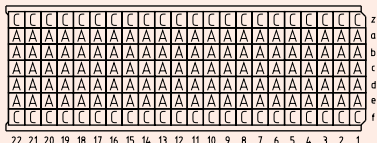
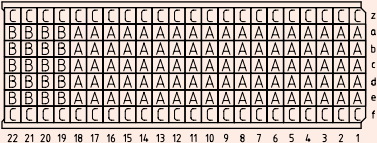
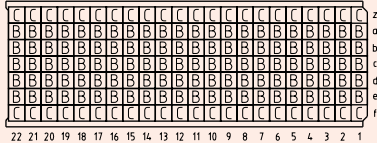
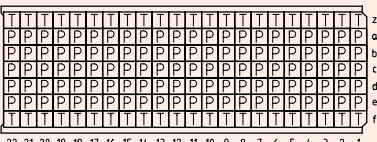


Male Connectors Type B-22 (Compact PCI P2/P5)



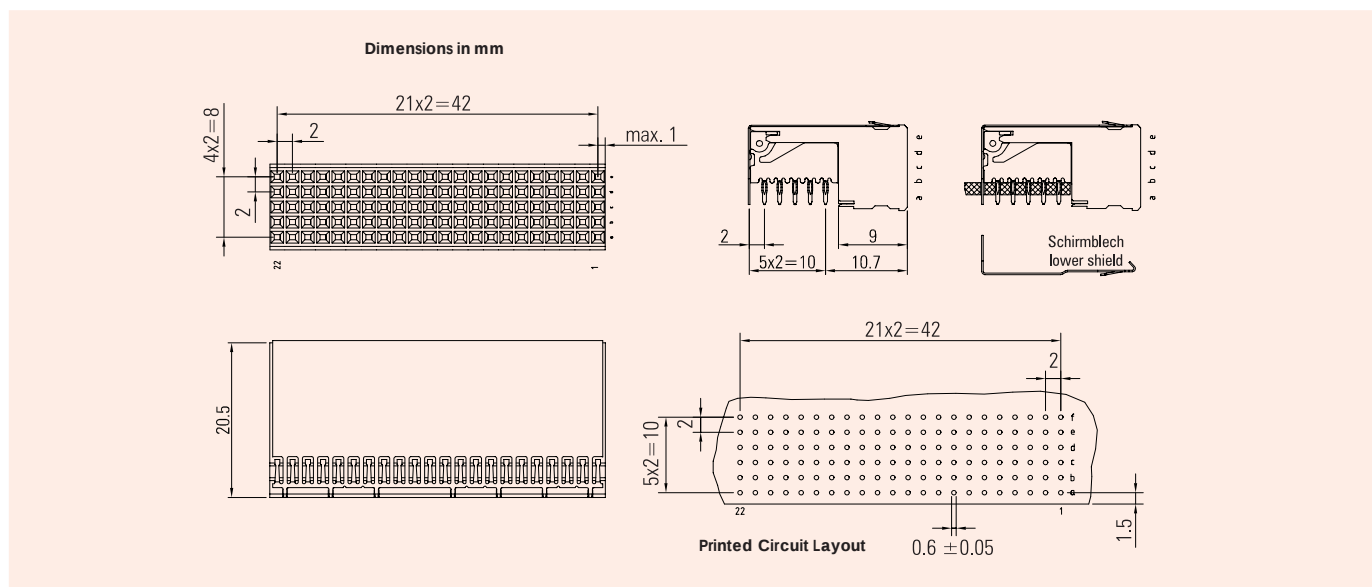
Note: PCB thickness 1,6 - 2,8 mm Part No. XXX-XXXXX-05

Insertion Tool: Part No. 884-701-W22

Assembly Drawing	No. of Positions	Row	Type	Pin lenght	Part Numbers
	154	z a b c d e f	C A A A A A C	11,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 11,25/3,7	243-22310-15
cPCI Telephony Spec. 	154	z a b c d e f	C * * * * * C	11,25/3,7 * * * * * 11,25/3,7	243-22311-15
	154	z a b c d e f	C B B B B B C	11,25/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 11,25/3,7	243-22320-15
	154	z a b c d e f	T P P P P P T	11,25/16,0 9,75/14,5 9,75/14,5 9,75/14,5 9,75/14,5 9,75/14,5 11,25/16,0	243-22360-15

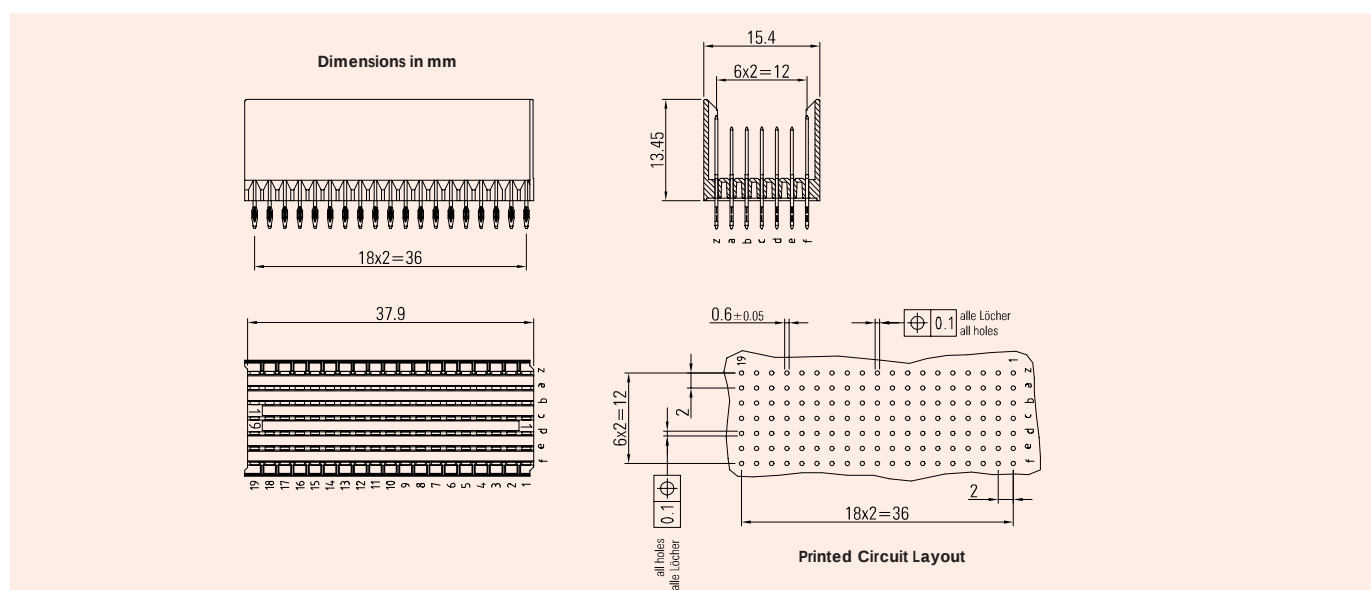


Female Connectors Type B-22 (Compact PCI J2/J5)



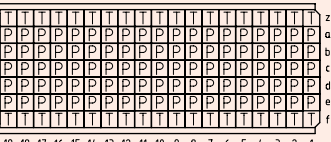
Type	No. of Positions	Part Numbers
without shielding	110	244-22000-15
with shielding	110	244-22300-15
lower shield		244-22600-1
THTR without shielding	110	244-22000-25
THTR with shielding	110	244-22300-25

Male Connectors Type B-19 (VME J0 and C-PCI P3)



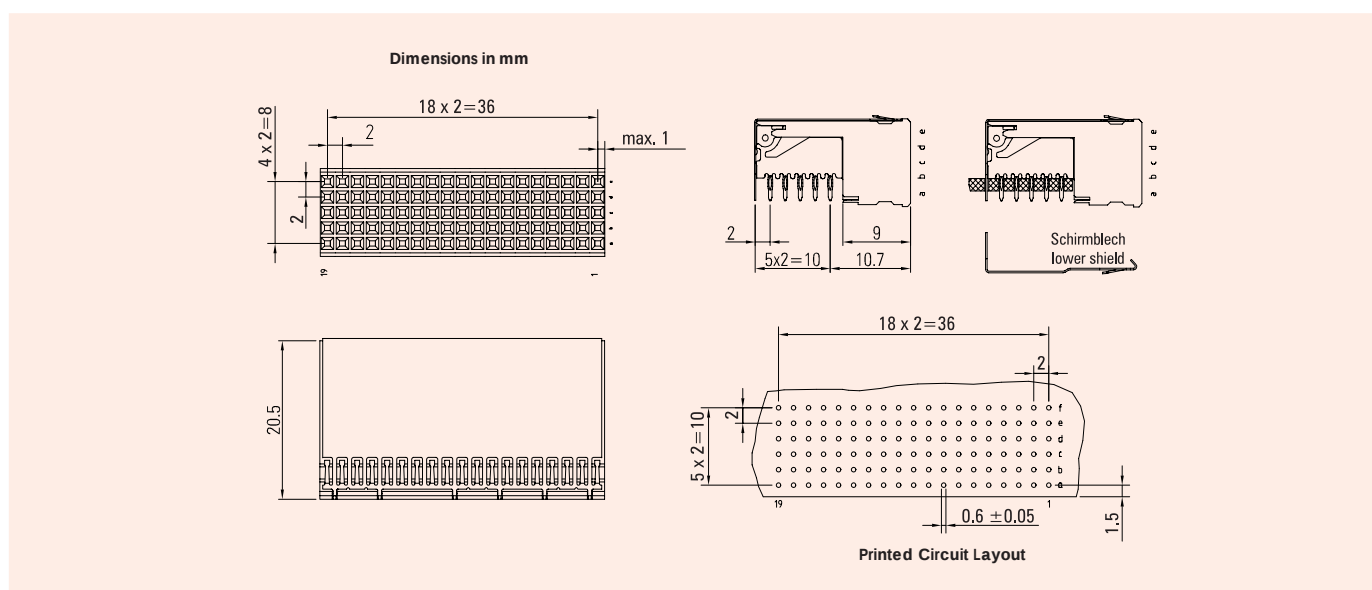
Note: PCB thickness 1,6 - 2,8 mm Part No. XXX-XXXXX-05

Insertion Tool: Part No. 884-701-W19

Assembly Drawing	No. of Positions	Row	Type	Pin length	Part Numbers
	95	z a b c d e f	– A A A A A –	–/– 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 –/–	243-23010-15
	133	z a b c d e f	C A A A A A C	11,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 11,25/3,7	243-23310-15
	133	z a b c d e f	C B B B B B C	11,25/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 11,25/3,7	243-23320-15
	133	z a b c d e f	T P P P P P T	11,25/16,0 9,75/14,5 9,75/14,5 9,75/14,5 9,75/14,5 9,75/14,5 11,25/16,0	243-23360-15



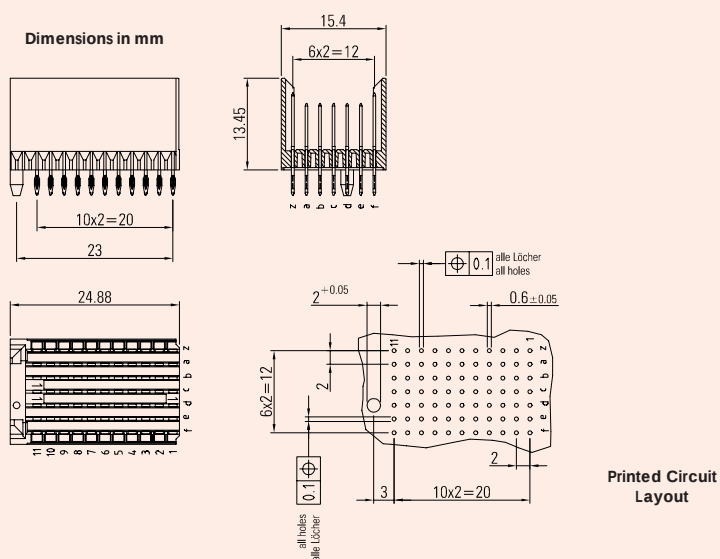
Female Connectors Type B-19 (VME P0 and C-PCI J3)



Type	No. of Positions	Part Numbers
without shielding	95	244-23000-15
with shielding	95	244-23300-15
lower shield		244-23600-1
THTR without shielding	95	244-23000-25
THTR	95	244-23300-25

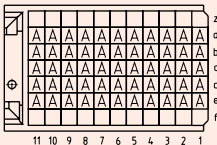
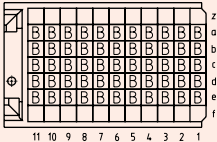
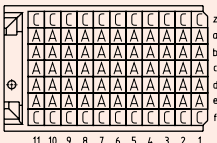
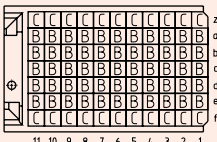


Male Connectors Type C



Note: PCB thickness 1.6 - 2.8 mm Part No. XXX-XXXXX-05

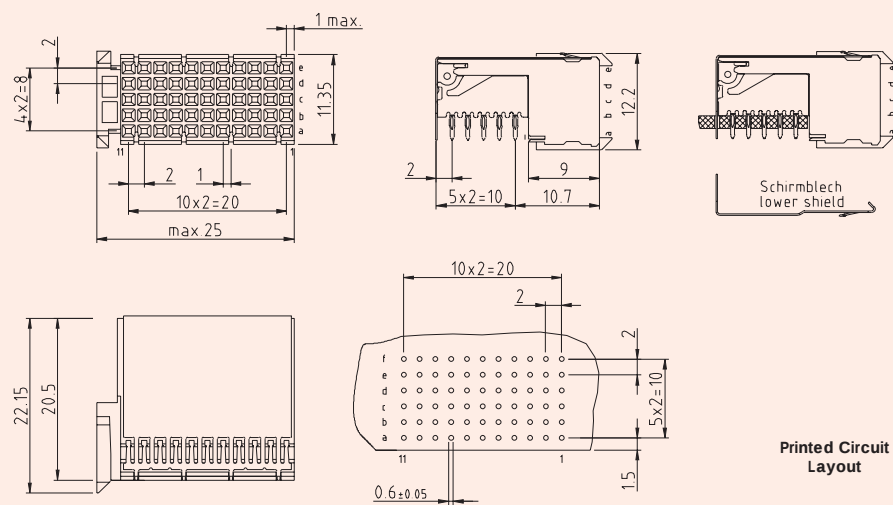
Insertion Tool: Part No. 884-702-W11

Assembly Drawing	No. of Positions	Row	Type	Pin length	Part Numbers
	55	z a b c d e f	– A A A A A –	–/– 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 –/–	243-31010-15
	55	z a b c d e f	– B B B B B –	–/– 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 –/–	243-31020-15
	77	z a b c d e f	C A A A A A C	11,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 11,25/3,7	243-31310-15
	77	z a b c d e f	C B B B B B C	11,25/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 11,25/3,7	243-31320-15



Female Connectors Type C

Dimensions in mm

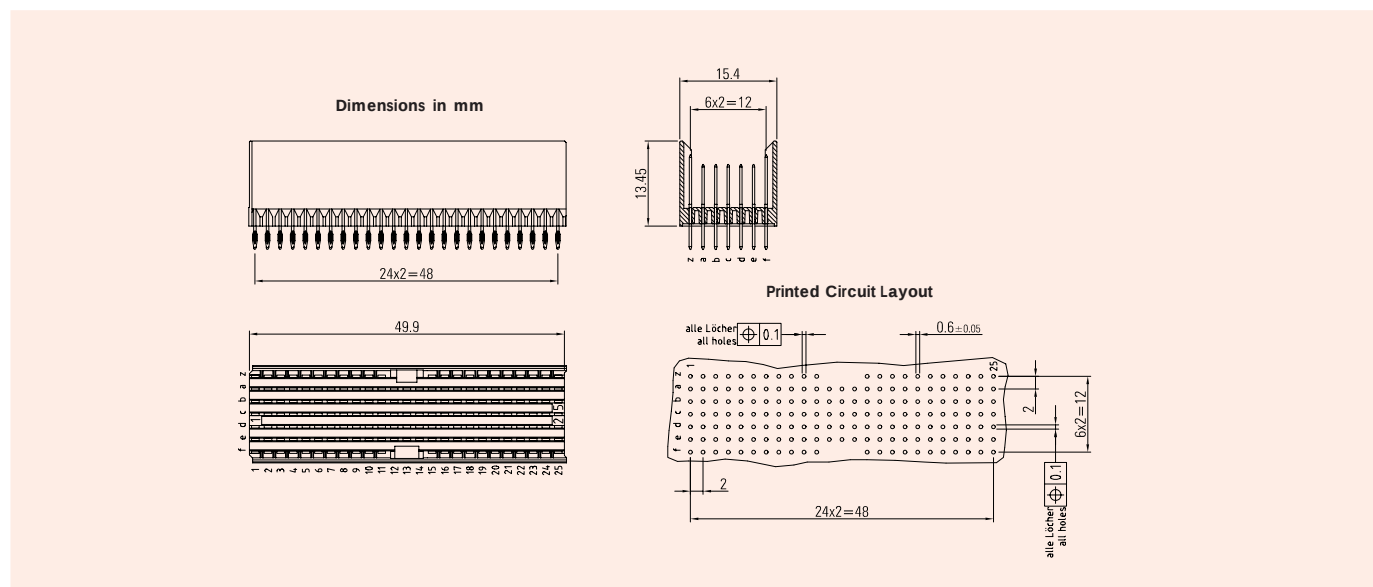


Printed Circuit
Layout

Type	No. of Positions	Part Numbers
without shielding	55	244-31000-15
with shielding	55	244-31300-15
lower shield		244-31600-1
THTR without shielding	55	244-31000-25
THTR with shielding	55	244-31300-25



Male Connectors Type AB-25



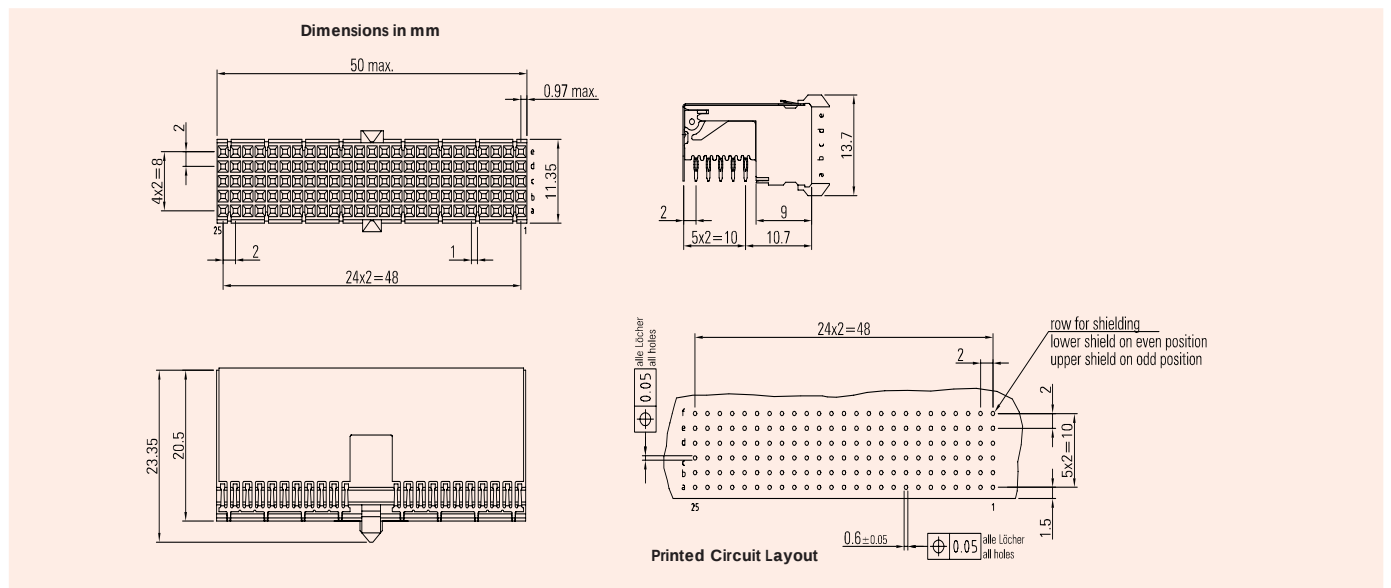
Note: PCB thickness 1,6 - 2,8 mm Part No. XXX-XXXX-05

Insertion Tool: Part No. 884-708-W25

Assembly Drawing	No. of Positions	Row	Type	Pin length	Part Numbers
	125	z a b c d e f	– A A A A A –	–/– 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 –/–	243-61010-15
	169	z a b c d e f	C A A A A A C	11,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 11,25/3,7	243-61310-15
	169	z a b c d e f	C B B B B B C	11,25/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 11,25/3,7	243-61320-15
	169	z a b c d e f	T P P P P P T	11,25/16,0 9,75/14,5 9,75/14,5 9,75/14,5 9,75/14,5 9,75/14,5 11,25/16,0	243-61360-15



Female Connectors Type AB-25

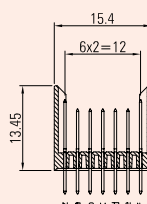
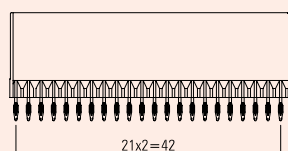


Type	No. of Positions	Part Numbers
connectors without shielding	125	244-61000-15
connectors with shielding	125	244-61300-15
lower shield		244-11600-1
THTR without shielding	125	244-61000-25
THTR with shielding	125	244-61300-25

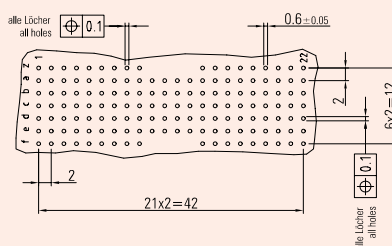
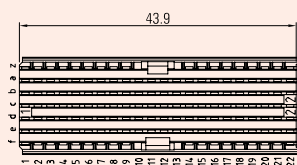


Male Connectors Type AB-22

Dimensions in mm

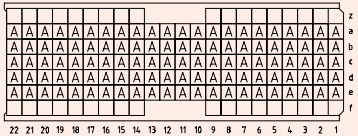
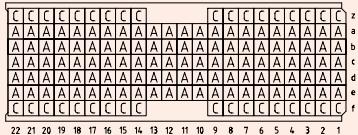
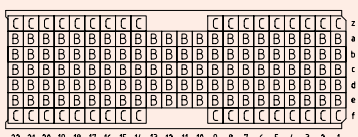
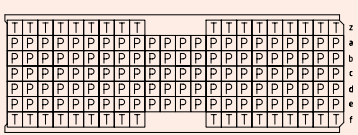


Printed Circuit Layout



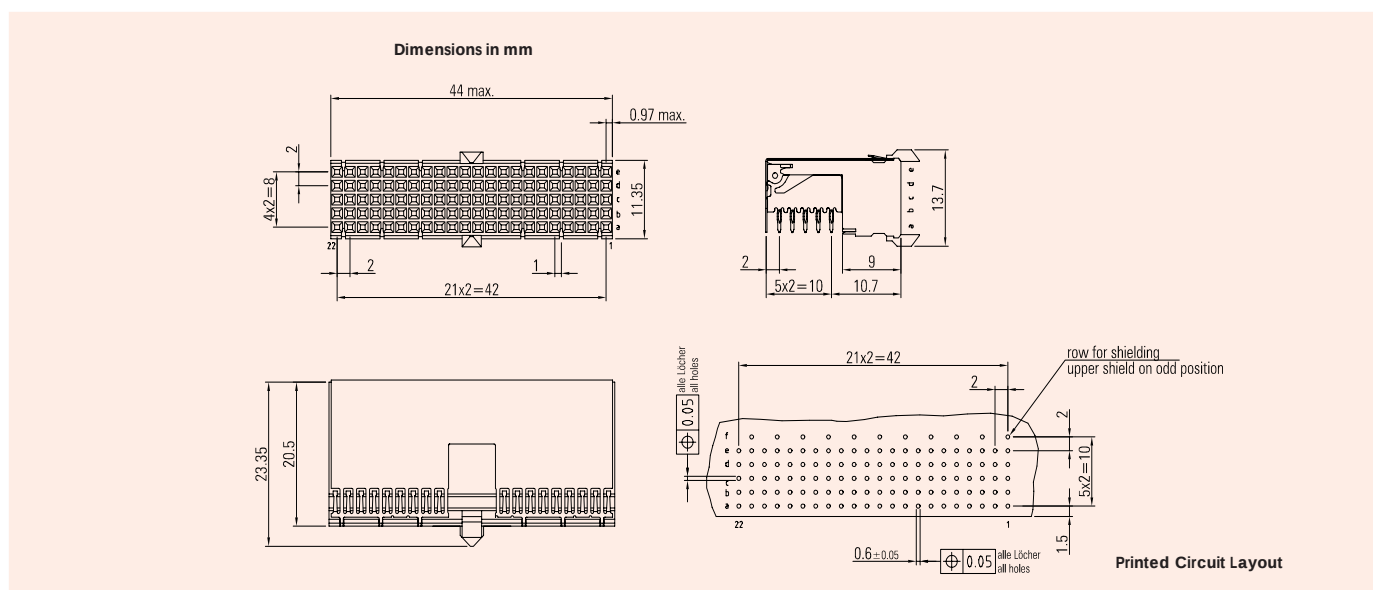
Note: PCB thickness 1,6 - 2,8 mm Part No. XXX-XXXXX-05

Insertion Tool: Part No. 884-708-W22

Assembly Drawing	No. of Positions	Row	Type	Pin length	Part Numbers
	110	z a b c d e f	– A A A A A –	–/– 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 –/–	243-62010-15
	146	z a b c d e f	C A A A A A C	11,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 11,25/3,7	243-62310-15
	146	z a b c d e f	C B B B B B C	11,25/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 11,25/3,7	243-62320-15
	146	z a b c d e f	T P P P P P T	11,25/16,0 9,75/14,5 9,75/14,5 9,75/14,5 9,75/14,5 9,75/14,5 11,25/16,0	243-62360-15



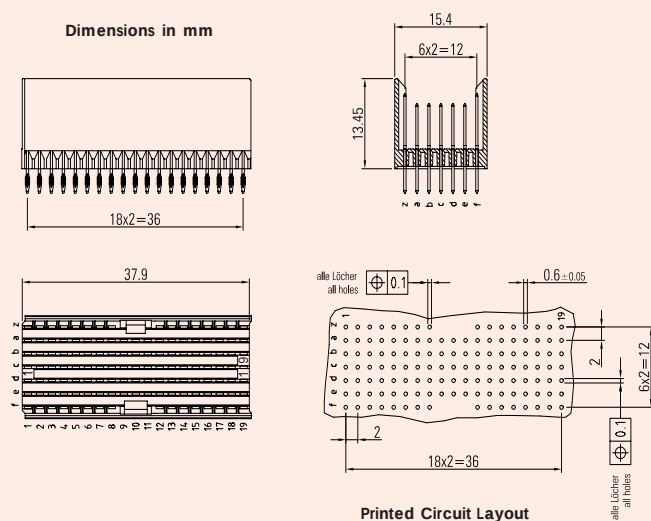
Female Connectors Type AB-22



Type	No. of Positions	Part Numbers
connectors without shielding	110	244-62000-15
connectors with shielding	110	244-62300-15
THTR without shielding	110	244-62000-25
THTR with shielding	110	244-62300-25

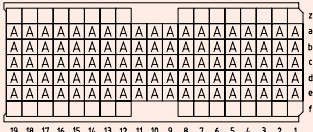
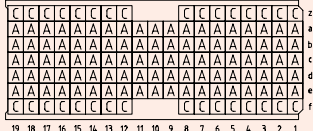
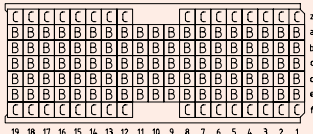
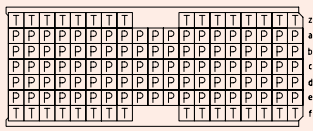


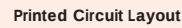
Male Connectors Type AB-19

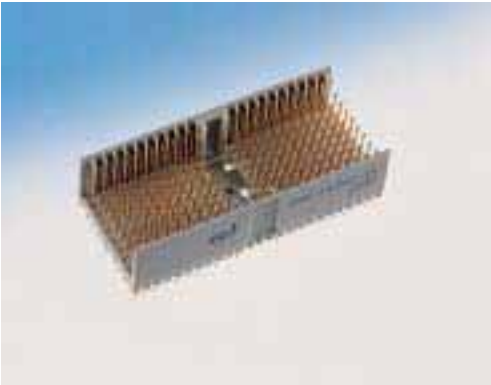


Note: PCB thickness 1.6 - 2.8 mm Part No. XXX-XXXXX-05

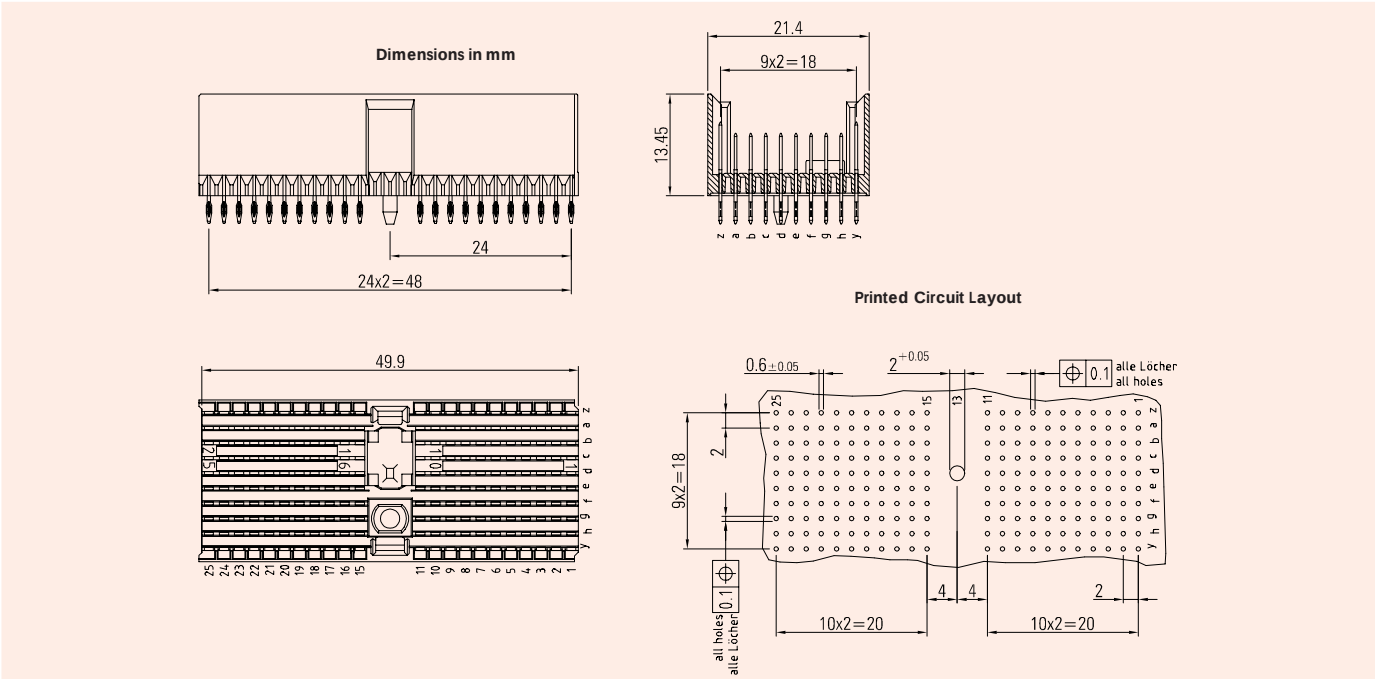
Insertion Tool: Part No. **884-708-W19**

Assembly Drawing	No. of Positions	Row	Type	Pin length	Part Numbers
	95	z a b c d e f	– A A A A A –	–/– 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 –/–	243-63010-15
	127	z a b c d e f	C A A A A A C	11,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 11,25/3,7	243-63310-15
	127	z a b c d e f	C B B B B B C	11,25/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 9,75/3,7 11,25/3,7	243-63320-15
	127	z a b c d e f	T P P P P P T	11,25/16,0 9,75/14,5 9,75/14,5 9,75/14,5 9,75/14,5 9,75/14,5 11,25/16,0	243-63360-15

2.25



Male Connectors Type D

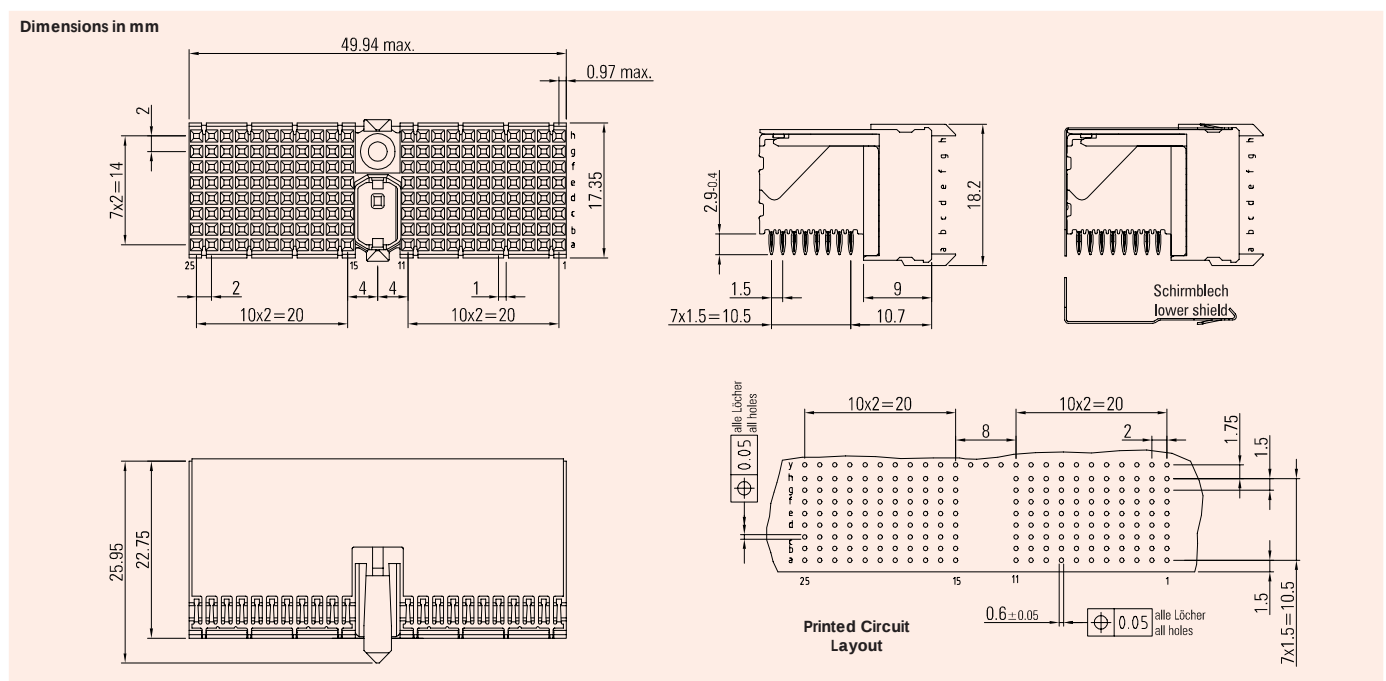


Assembly Drawing	No. of Positions	Row	Type	Pin length	Part Numbers
	176	z a b c d e f g h y	– A A A A A A A A A –	–/– 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 –/–	245-11010-15
	220	z a b c d e f g h y	C A A A A A A A A C	11,25/3,7 8,75/3,7 8,75/3,7 8,75/3,7 8,75/3,7 8,75/3,7 8,75/3,7 8,75/3,7 8,75/3,7 11,25/3,7	245-11310-15

Note: PCB thickness 1,6 - 2,8 mm Part No. XXX-XXXX-05
Insertion Tool: Part Number 884-710-W25



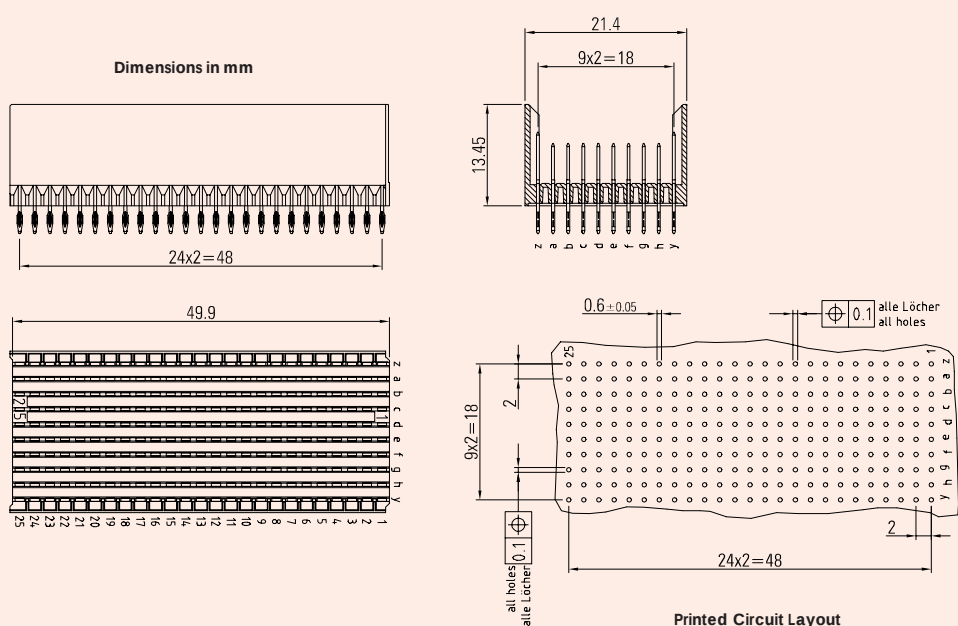
Female Connectors Type D

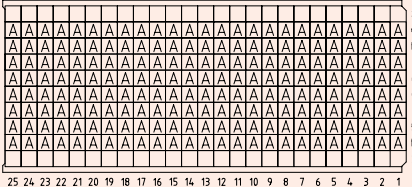


Type	No. of Positions	Part Numbers
connector without shielding	176	246-11000-15
connector with shielding	176	246-11300-15
lower shield		246-11600-1



Male Connectors Type E



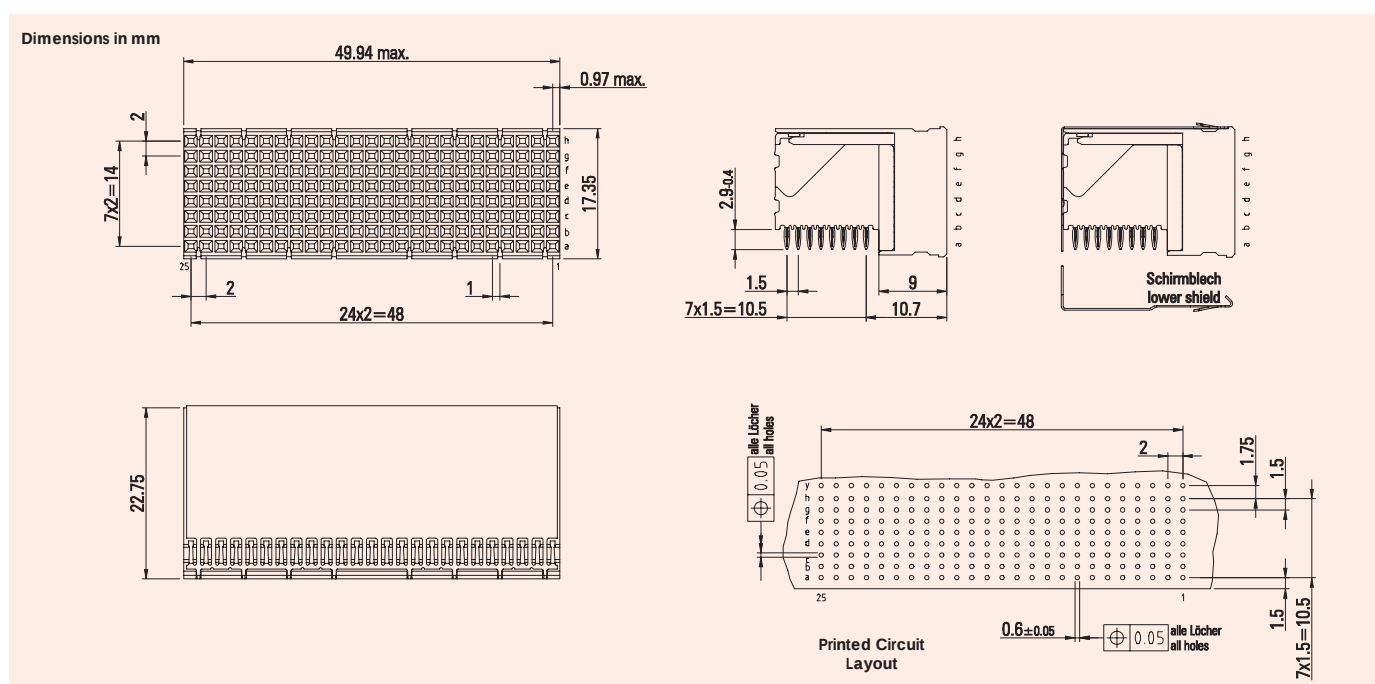
Assembly Drawing	No. of Positions	Row	Type	Pin length	Part Numbers
	200	z a b c d e f g h y	– A A A A A A A A A –	–/– 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 –/–	245-21010-15
	250	z a b c d e f g h y	C A A A A A A A A C	11,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 11,25/3,7	245-21310-15

Note: PCB thickness 1.6 - 2.8 mm Part No. XXX-XXXXX-05

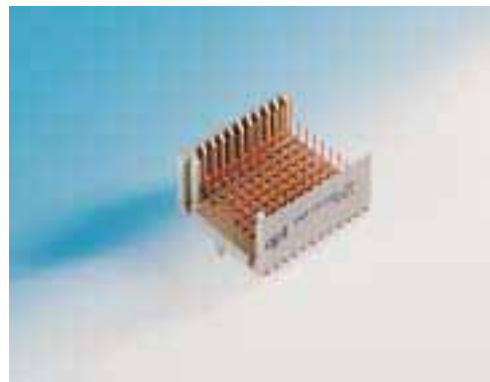
Insertion Tool: Part Number **884-711-W25**



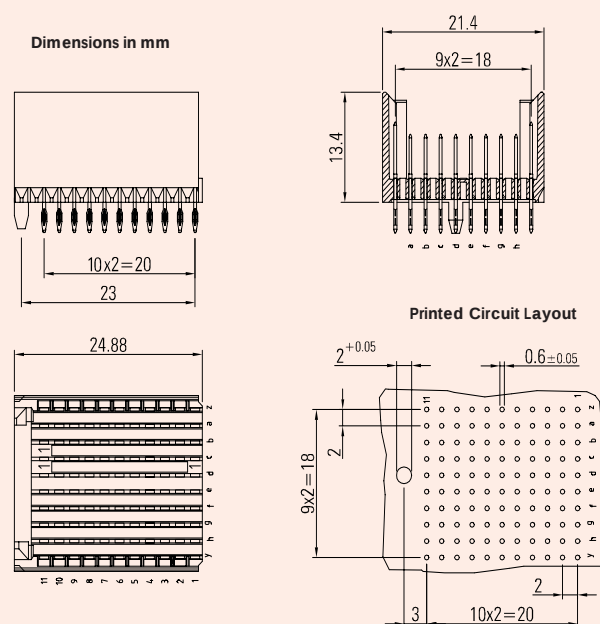
Female Connectors Type E

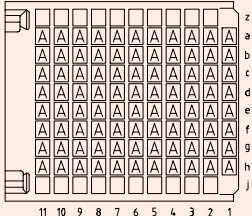
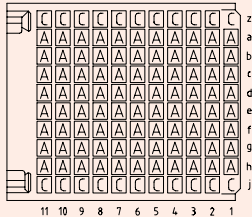


Type	No. of Positions	Part Numbers
connector without shielding	200	246-21000-15
connector with shielding	200	246-21300-15
lower shield		246-21600-1



Male Connectors Type F

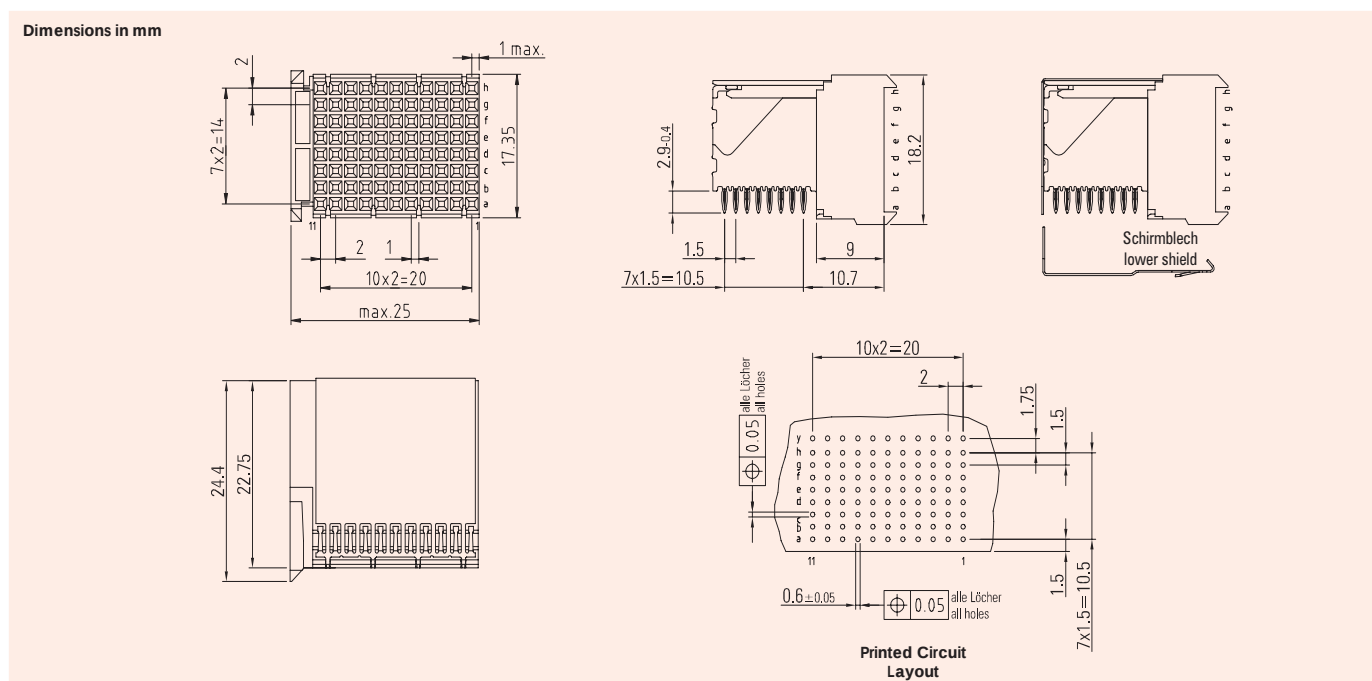


Assembly Drawing	No. of Positions	Row	Type	Pin length	Part Numbers
	88	z a b c d e f g h y	– A A A A A A A A –	–/– 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 –/–	245-31010-15
	110	z a b c d e f g h y	C A A A A A A A A C	11,25/3,7 8,75/3,7 8,75/3,7 8,75/3,7 8,75/3,7 8,75/3,7 8,75/3,7 8,75/3,7 8,75/3,7 11,25/3,7	245-31310-15

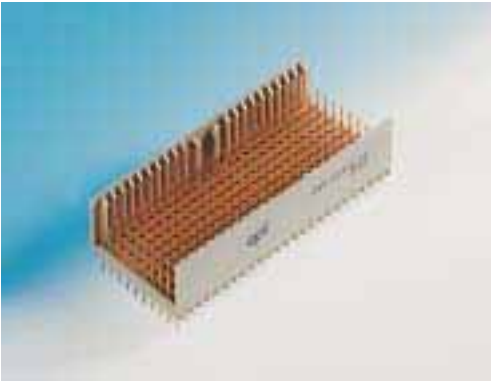
Insertion Tool: Part Number **884-713-W11**



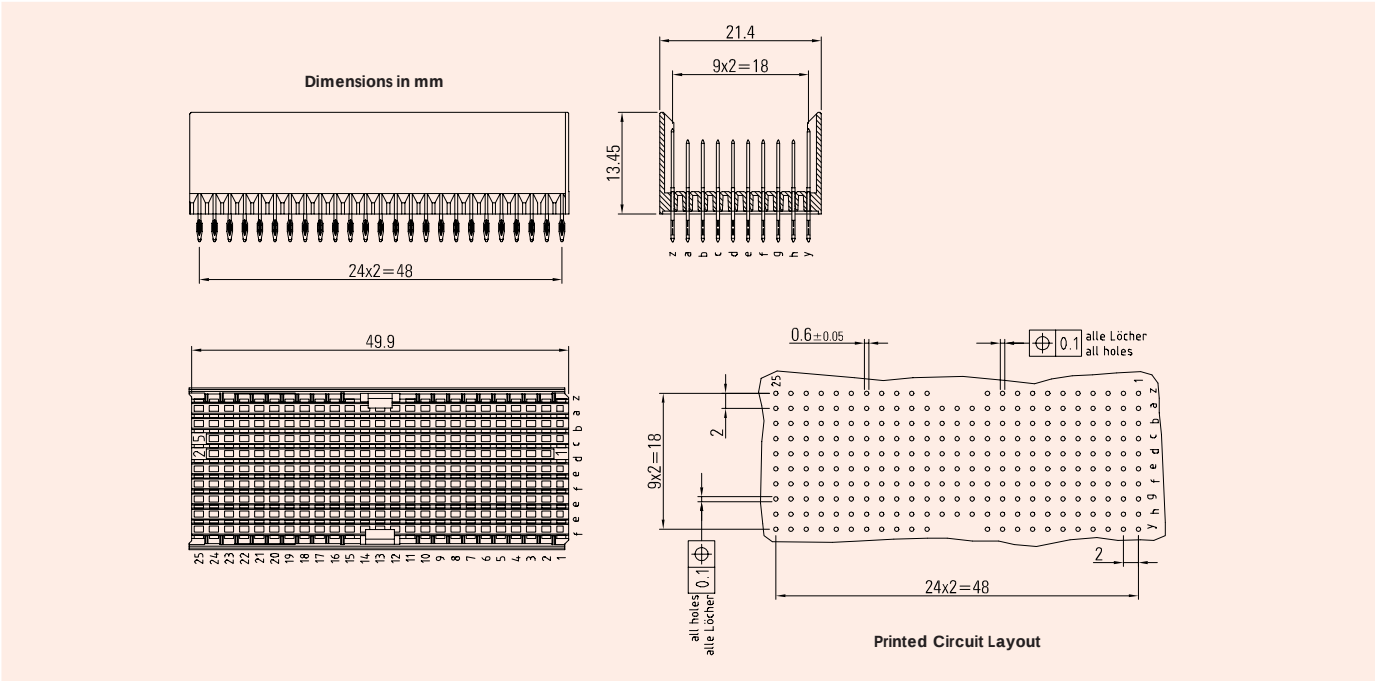
Female Connectors Type F



Type	No. of Positions	Part Numbers
connector without shielding	88	246-31000-15
connector with shielding	88	246-31300-15
lower shield		246-31600-1



Male Connectors Type DE

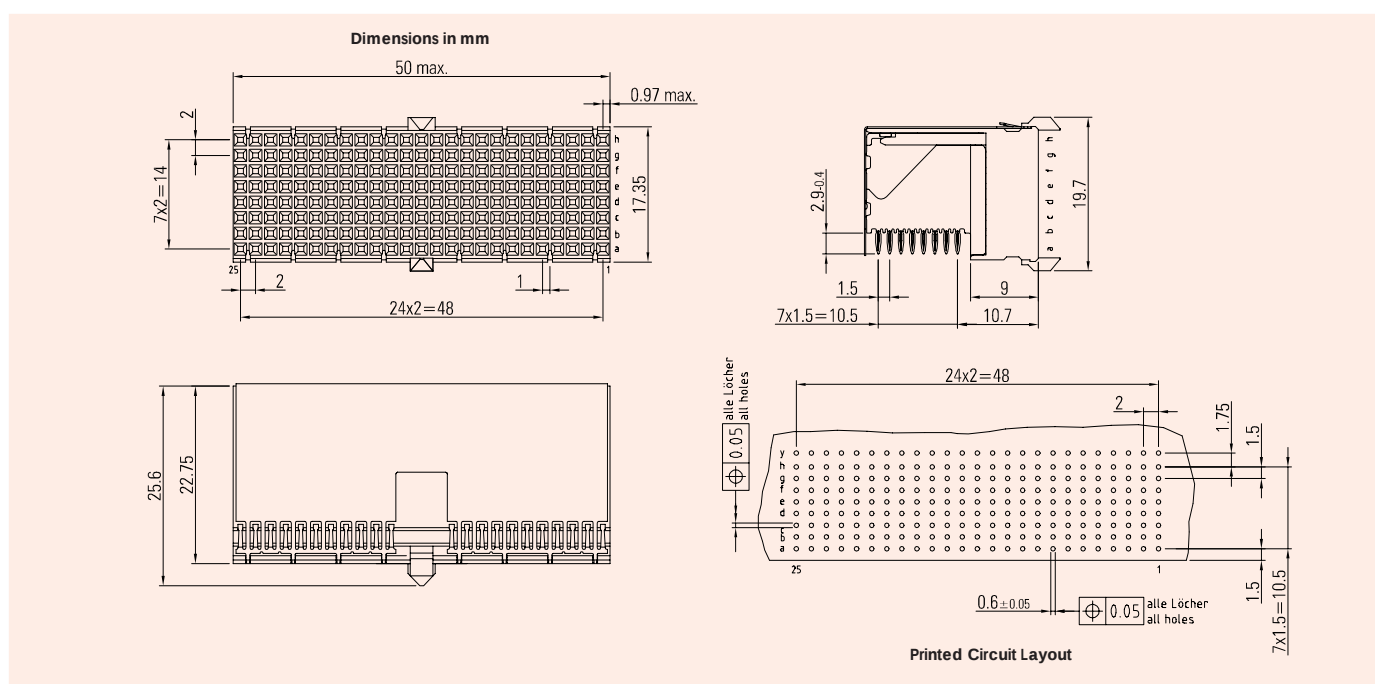


Assembly Drawing	No. of Positions	Row	Type	Pin length	Part Numbers
	200	z a b c d e f g h y	– A A A A A A A A A –	–/– 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 –/–	245-61010-15
	244	z a b c d e f g h y	C A A A A A A A A C	11,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 8,25/3,7 11,25/3,7	245-61310-15

Note: PCB thickness 1,6 - 2,8 mm Part No. XXX-XXXX-05
Insertion Tool: Part Number 884-712-W25



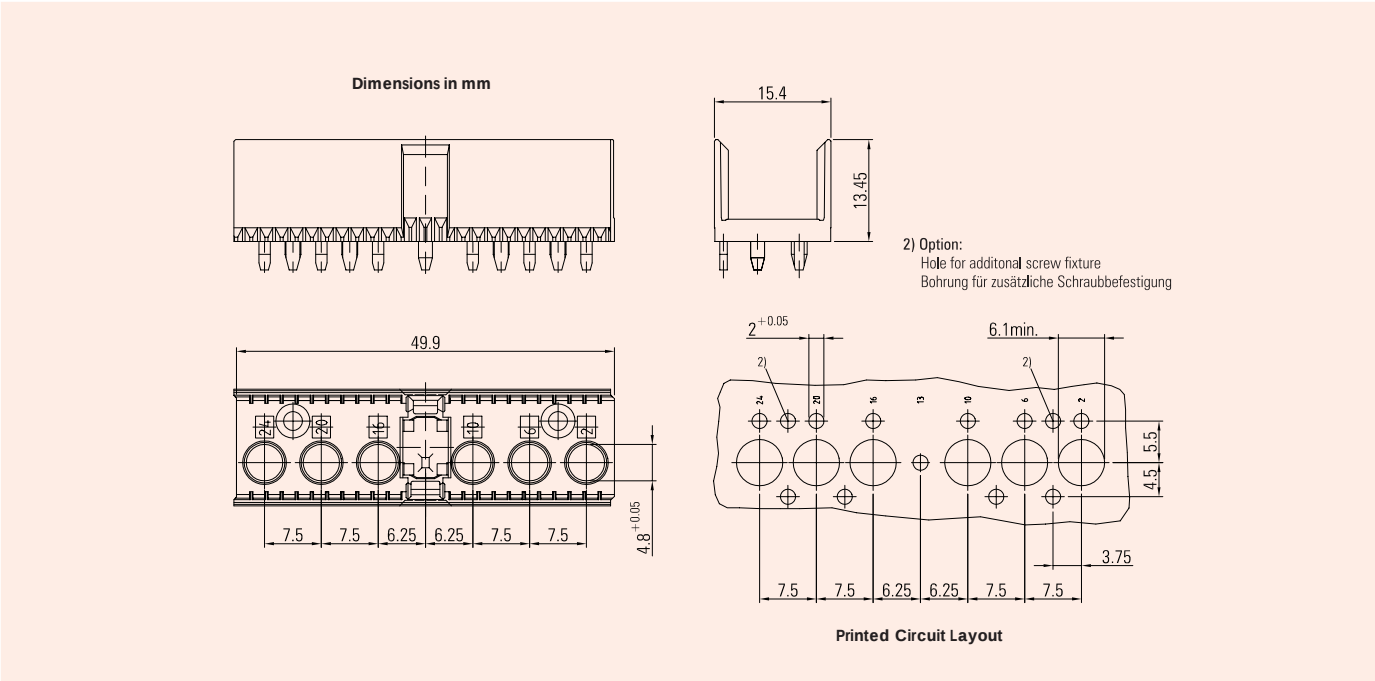
Female Connectors Type DE



Type	No. of Positions	Part Numbers
connector without shielding	200	246-61000-15
connector with shielding	200	246-61300-15
lower shield		246-11600-1



Male Connectors Type L



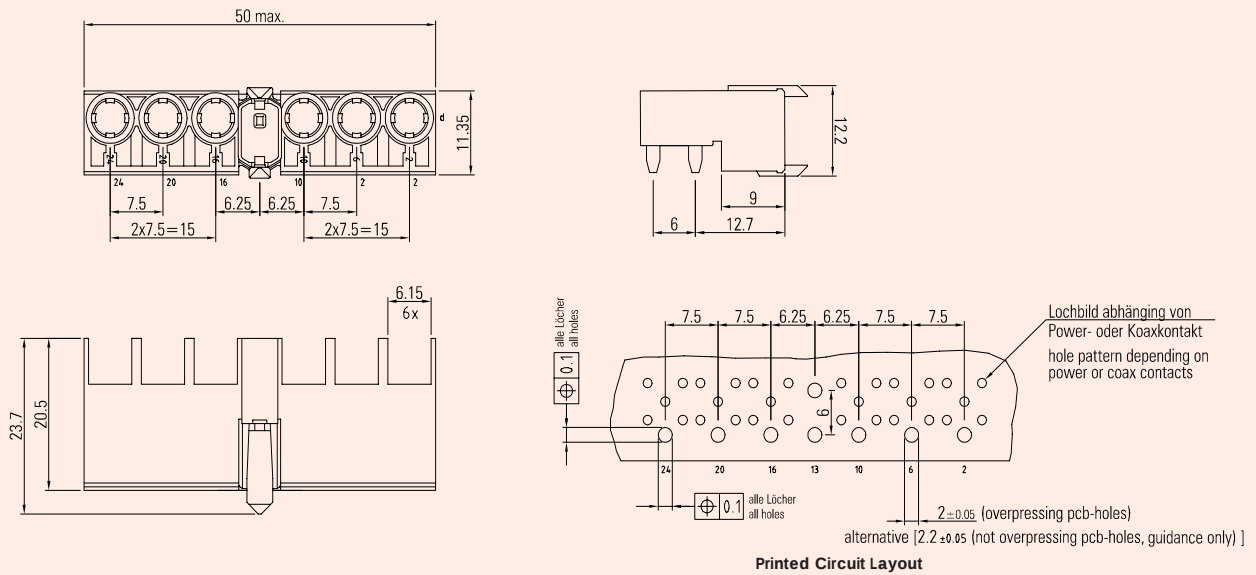
Assembly Drawing	No. of Positions	Row	special contact	Part Number
	6	1	power / cable contacts	243-51000
			pressfit coax	243-53000

Insertion Tool: Part Number 884-707-W1

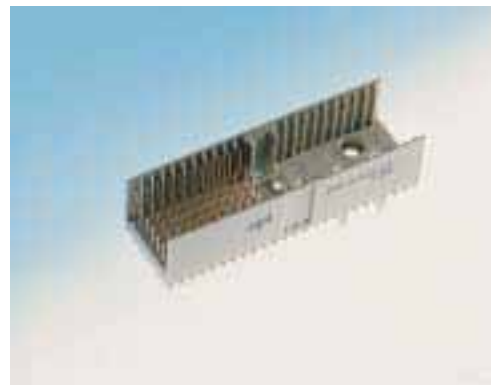


Female Connectors Type L

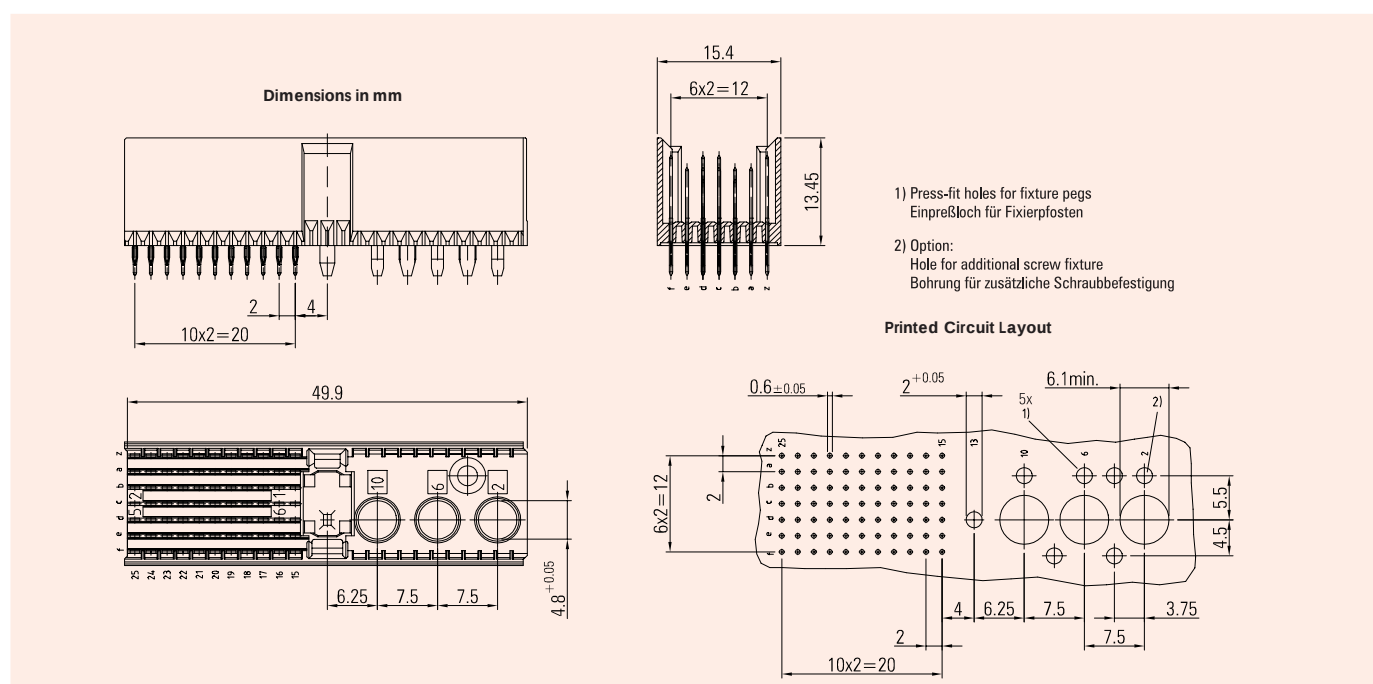
Dimensions in mm

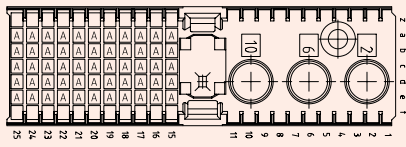
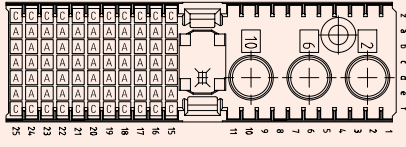


Type	No. of Positions	Part Number
connector without shielding	6	244-51000



Male Connectors Type M

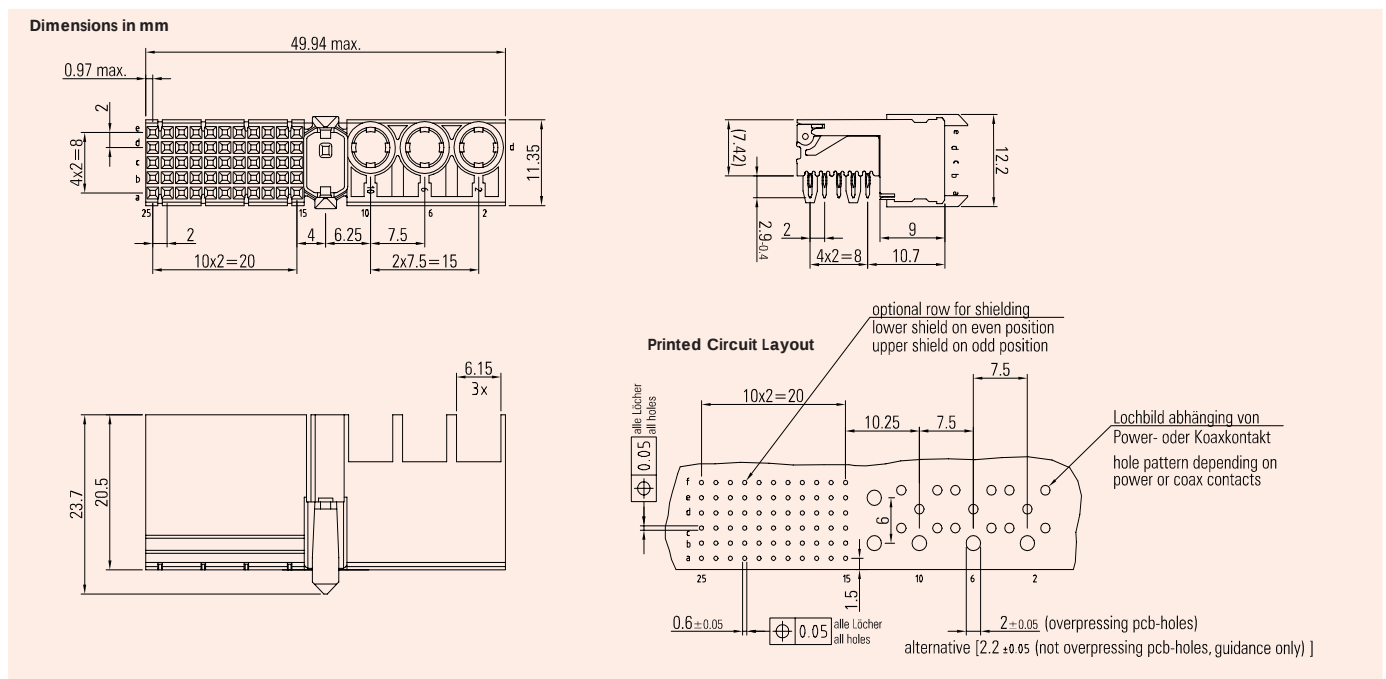


Assembly Drawing	No. of Positions	Row	Type	Pin length	special contacts	Part Numbers
	55+3	z	—	—/—	power / cable contacts	243-41010-15
		a	A	8,25/3,7		
		b	A	8,25/3,7		
		c	A	8,25/3,7	pressfit coax	243-42010-15
		d	A	8,25/3,7		
		e	A	8,25/3,7		
	77+3	f	—	—/—	power / cable contacts	243-41310-15
		z	C	11,25/3,7		
		a	A	8,25/3,7		
		b	A	8,25/3,7	pressfit coax	243-42310-15
		c	A	8,25/3,7		
		d	A	8,25/3,7		
		e	A	8,25/3,7	pressfit coax	243-42310-15
		f	C	11,25/3,7		
		z	C	11,25/3,7		

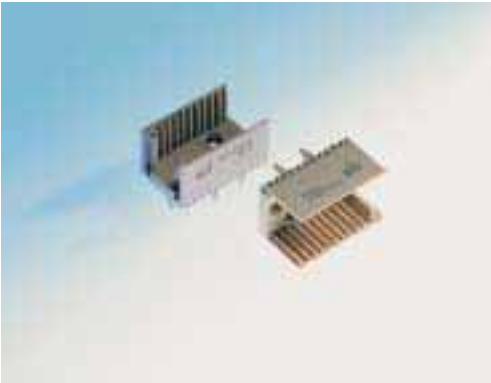
Insertion Tool: Part Number 884-707-W2



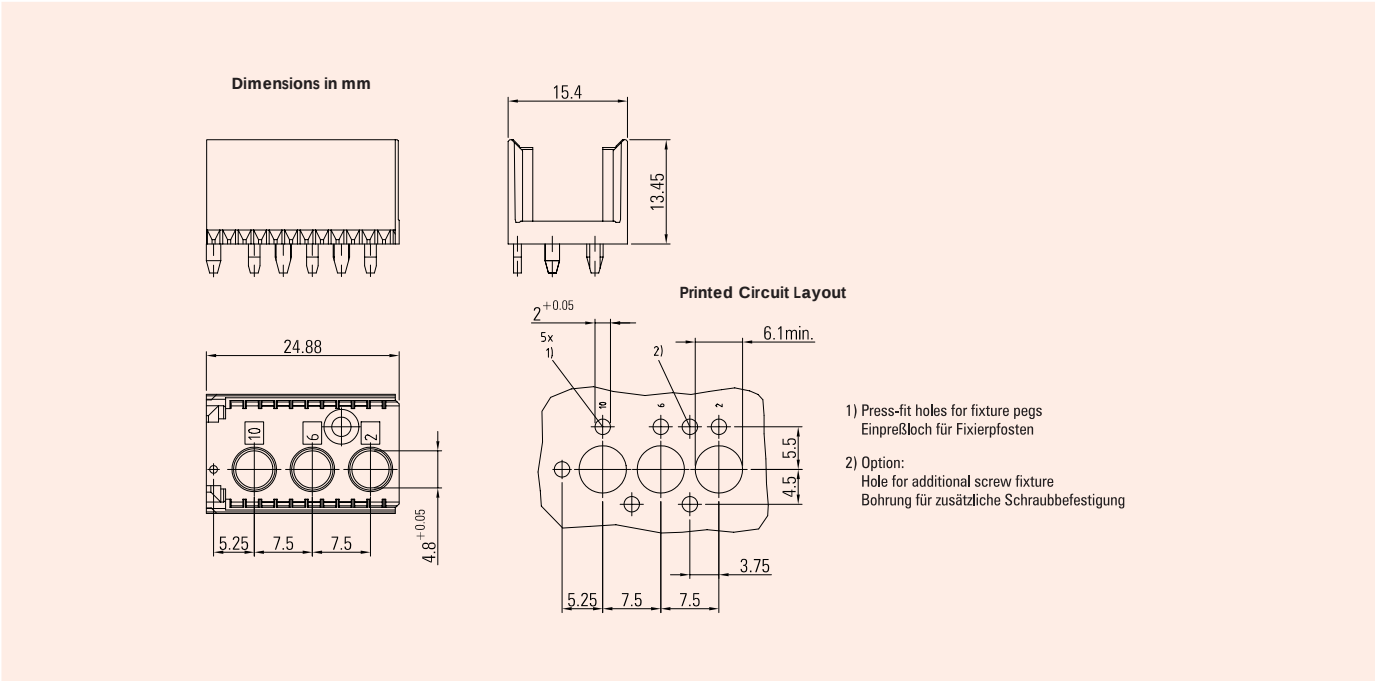
Female Connectors Type M



Type	No. of Positions	Part Numbers
connector without shielding	55+3	244-41000-15
connector with shielding	55+3	244-41300-15
lower shield		244-31600-1



Male Connectors Type N



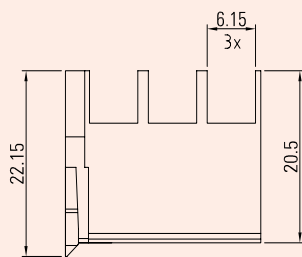
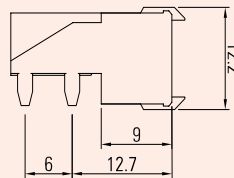
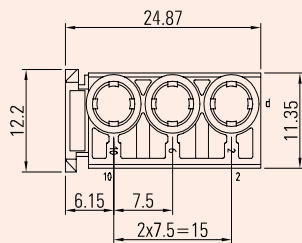
Assembly Drawing	No. of Positions	Row	special contact	Part Number
	3	-	power / cable contacts	243-52000
			pressfit coax	243-54000

Insertion Tool: Part Number 884-707-W3

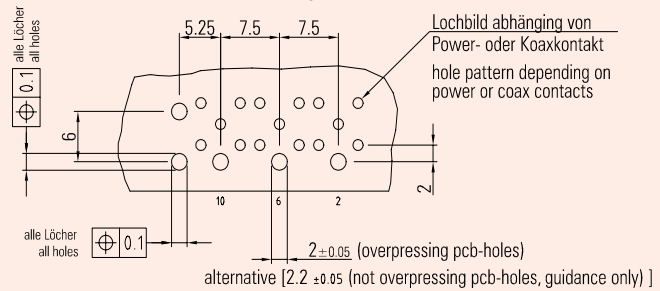


Female Connectors Type N

Dimensions in mm



Printed Circuit Layout

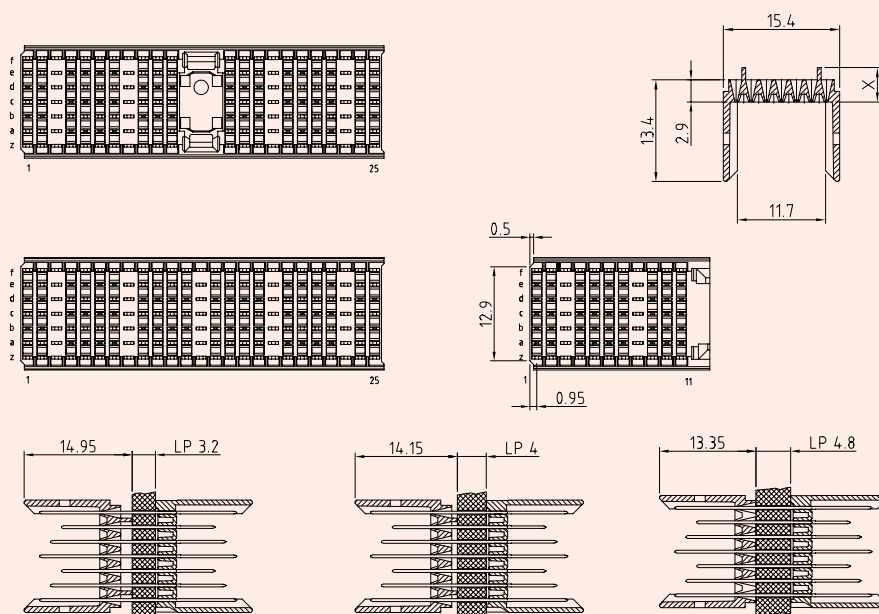


Type	No. of Positions	Part Number
connector without shielding	3	244-52000



Shrouds for Male Connectors Type A, B, B-22, B-19 and C

Dimensions in mm



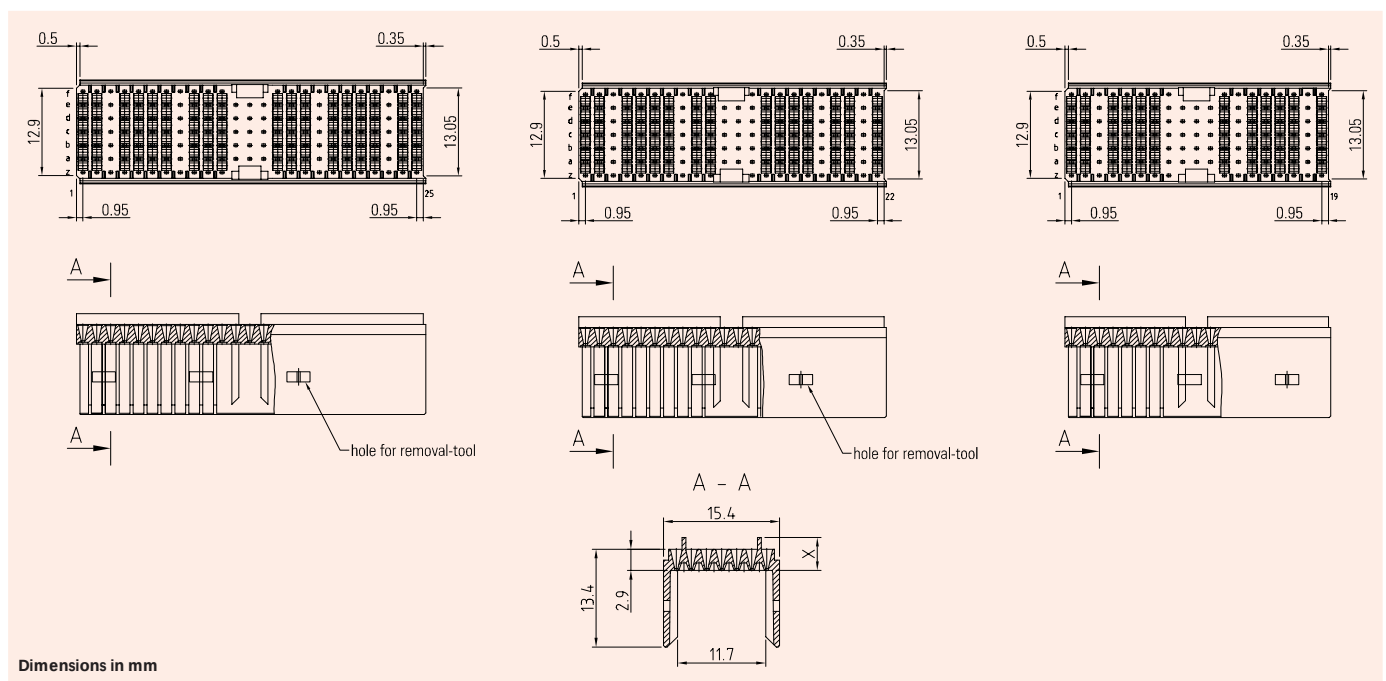
PCB thickness	< 2,4 mm	2,4 - 3,2 mm	3,2 - 4 mm	4,0 - 4,8 mm	> 4,8 mm
X	6,3 mm	4,9 mm	4,5 mm	3,7 mm	2,9 mm
Shroud	16,75 mm	15,35 mm	14,95 mm	14,15 mm	13,35 mm
Connector Type	Part Numbers				
A	243-5525-5	243-5525-4	243-5525-1	243-5525-2	243-5525-3
B	243-5625-5	243-5625-4	243-5625-1	243-5625-2	243-5625-3
B-22	243-5622-5	243-5622-4	243-5622-1	243-5622-2	243-5622-3
B-19	243-5619-5	243-5619-4	243-5619-1	243-5619-2	243-5619-3
C	243-5511-5	243-5511-4	243-5511-1	243-5511-2	243-5511-3

On request: other heights and special shrouds

Set and stripping Tool see page 5.5



Shrouds for Male Connectors Type AB



PCB thickness	< 2,4 mm	2,4 - 3,2 mm	3,2 - 4 mm	4,0 - 4,8 mm	> 4,8 mm
x	6,3 mm	4,9 mm	4,5 mm	3,7 mm	2,9 mm
Shroud hight	16,75 mm	15,35 mm	14,95 mm	14,15 mm	13,35 mm
Connector Type	Part Numbers				
AB-25	243-5725-5	243-5725-4	243-5725-1	243-5725-2	243-5725-3
AB-22	243-5722-5	243-5722-4	243-5722-1	243-5722-2	243-5722-3
AB-19	243-5719-5	243-5719-4	243-5719-1	243-5719-2	243-5719-3

On request: other hights and special shrouds

Set and Stripping Tool see page 5.5

Overview compactPCI Connectors

Female connector for daughter card	Location	Shielding	ept Part Number
Type A	J1 / rJ1 / J4 / rJ4	With upper shield	244-11300-15
Type B22	J2 / J5	With upper shield	244-22300-15
Type AB22*	rJ2 / rJ5	With upper shield	244-62300-15
Type B19	J3	With upper shield	244-23300-15
Type AB19*	rJ3	With upper shield	244-63300-15
Type A for telephony	J4	With split shield	244-11305-15
Type A for telephony (mirrored)	rJ4	With split shield	244-11306-15

* AB connector are used for rear transition cards if AB shrouds are used
all connectors are also available without upper shield

Male connector for Backplane	Location	Contact loading *	ept Part Number
Type A Hot Swap	P1	CB***BC	243-11322-15
Type A Hot Swap for Midplane	P1	TP***PT	243-11710-15
Type monoblock Hot Swap	P1+P2	TP***PT	243-12322-15
Type B22	P2	CB***BC	243-22320-15
Type B22 AB compatible	P2 / P5	*PPPPP*	243-22361-15
Type B22 AB compatible	P2 / P5	*NNNNN*	243-22734-15
Type B22 AB compatible	P2 / P5	*SSSSS*	243-22371-15
Type B19	P3	CB***BC	243-23320-15
Type B19 AB compatible	P3	*PPPPP*	243-23361-15
Type B19 AB compatible	P3	*NNNNN*	243-23712-15
Type B19 AB compatible	P3	*SSSSS*	243-23371-15
Type A for telephony	P4	*****	243-11323-15
Type A for telephony Midplane	P4	*****	243-11709-15
Type A	P4	TPPPPT	243-11360-15
Type A	P4	TNNNNNT	243-11734-15
Type A	P4	TSSSST	243-11715-15
Type B22 for telephony	P5	C*****C	243-22311-15
Type B22 for telephony, Z row not loaded	P5	*****C	243-22312-15
Type B22 for telephony, Z row not loaded	P5	*****	243-22351-15

*different pins in that row / - not loaded
all connectors are also without Z row loaded available / for other pin arrangements consult ept

Coding keys	Color	application	ept Part Number
Male Backplane	Brilliant Blue	5V – P1	243-8014
Male Backplane	Cadmium Yellow	3,3V – P1	243-8031
Male Backplane	Strawberry red	Telephony – P4	243-8012
Female Daughtercard	Brilliant Blue	5V – J1	244-8014
Female Daughtercard	Cadmium Yellow	3,3V – J1	244-8031
Female Daughtercard Strawberry red	Telephony – J4	244-8012	

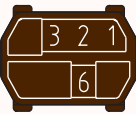
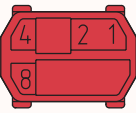
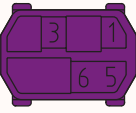
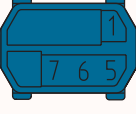
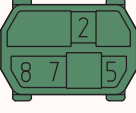
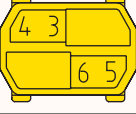
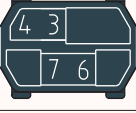
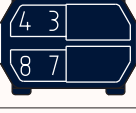
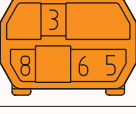
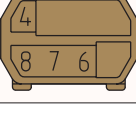
Shrouds	Location	height	Base thickness	PCB thickness	ept Part Number
Type A	P1 / P4	16,75 mm	6,3 mm	< 2,4 mm	243-5525-5
Type A	P1 / P4	15,35 mm	4,9 mm	2,4 - 3,2 mm	243-5525-4
Type A	P1 / P4	14,95 mm	4,5 mm	3,2 - 4,0 mm	243-5525-1
Type A	P1 / P4	14,15 mm	3,7 mm	4,0 - 4,8 mm	243-5525-2
Type A	P1 / P4	13,35 mm	2,9 mm	> 4,8 mm	243-5525-3
Type AB22	P2 / P5	16,75 mm	6,3 mm	< 2,4 mm	243-5722-5
Type AB22	P2 / P5	15,35 mm	4,9 mm	2,4 - 3,2 mm	243-5722-4
Type AB22	P2 / P5	14,95 mm	4,5 mm	3,2 - 4,0 mm	243-5722-1
Type AB22	P2 / P5	14,15 mm	3,7 mm	4,0 - 4,8 mm	243-5722-2
Type AB22	P2 / P5	13,35 mm	2,9 mm	> 4,8 mm	243-5722-3
Type AB19	P3	16,75 mm	6,3 mm	< 2,4 mm	243-5719-5
Type AB19	P3	15,35 mm	4,9 mm	2,4 - 3,2 mm	243-5719-4
Type AB19	P3	14,95 mm	4,5 mm	3,2 - 4,0 mm	243-5719-1
Type AB19	P3	14,15 mm	3,7 mm	4,0 - 4,8 mm	243-5719-2
Type AB19	P3	13,35 mm	2,9 mm	> 4,8 mm	243-5719-3

The height / base thickness of the shrouds depend on the thickness of the Backplane

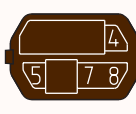
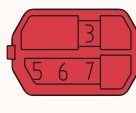
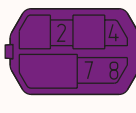
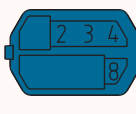
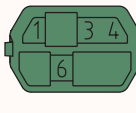
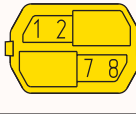
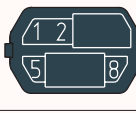
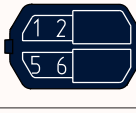
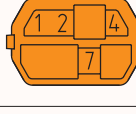
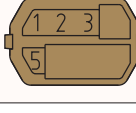
Coding Devices



Male connectors

Coding key	Code No.	Colour	Part Numbers
	1236	Nut brown RAL 8011	243-8011
	1248	Strawberry red RAL 3018 Telephony Spec.	243-8012
	1356	Blue lilac RAL 4005	243-8013
	1567	Brilliant blue RAL 5007 5,0 V C-PCI	243-8014
	2578	Reseda green RAL 6011	243-8021
	3456	Cadmium yellow RAL 1021 3,3 V C-PCI	243-8031
	3467	Slate grey RAL 7015	243-8032
	3478	Steel blue RAL 5011	243-8033
	3568	Pastel orange RAL 2003	243-8034
	4678	Ocher yellow RAL 1024	243-8041

Female connectors

Coding key	Code No.	Colour	Part Numbers
	4578	Nut brown RAL 8011	244-8011
	3567	Strawberry red RAL 3018 Telephony Spec.	244-8012
	2478	Blue lilac RAL 4005	244-8013
	2348	Brilliant blue RAL 5007 5,0 V C-PCI	244-8014
	1346	Reseda green RAL 6011	244-8021
	1278	Cadmium yellow RAL 1021 3,3 V C-PCI	244-8031
	1258	Slate grey RAL 7015	244-8032
	1256	Steel blue RAL 5011	244-8033
	1247	Pastel orange RAL 2003	244-8034
	1235	Ocher yellow RAL 1024	244-8041

Fax request (5+2)

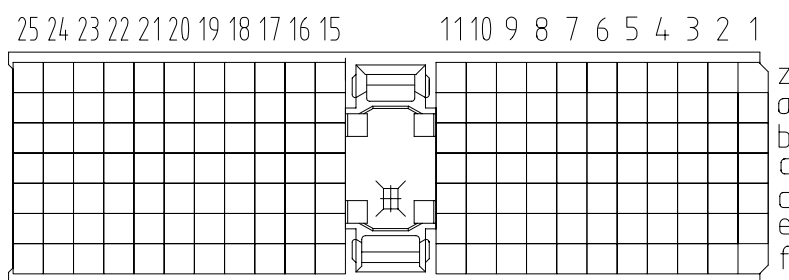
Company		Phone Number
First Name	Last Name	Fax Number
Adress		E-Mail
Adress		Signature

Please quote me for _____ pieces.

Please send me _____ sample pieces.

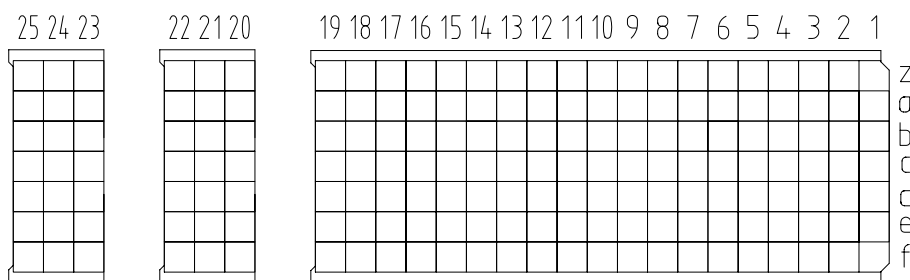
Front view

Modul A

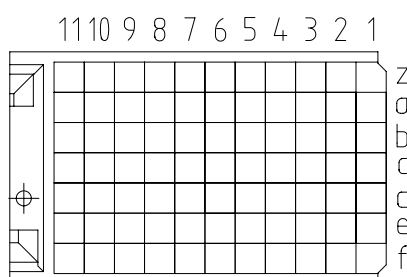


☐ B25 ☐ B22 ☐ B19 Please mark by cross

Modul B



Modul C



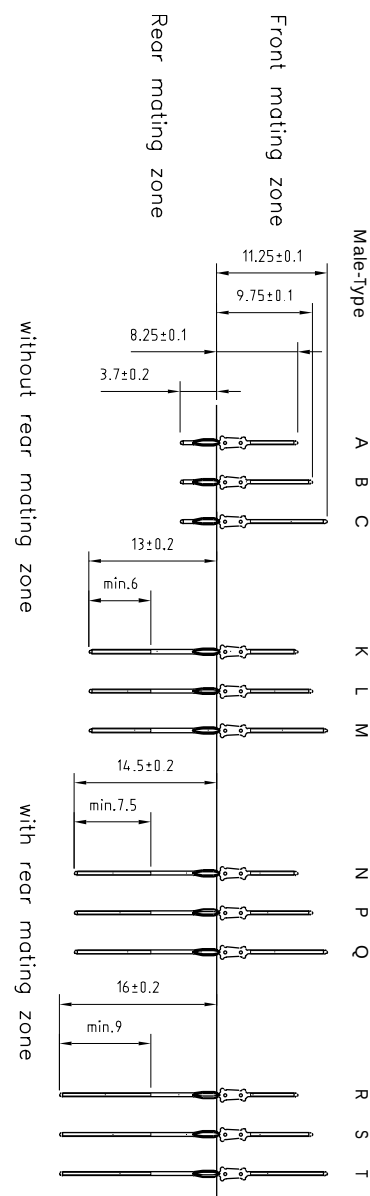
Assembly reference:

In order to be able to load the connectors economically we recommend a serial determination of the contact length. If only position 1 of a line is indicated, the entire line is loaded with this contact length. Exceptions can be registered at the respective position.

Surface:

Quality level 2 acc. to IEC 61076-4-101.

Au over PdNi over Ni.

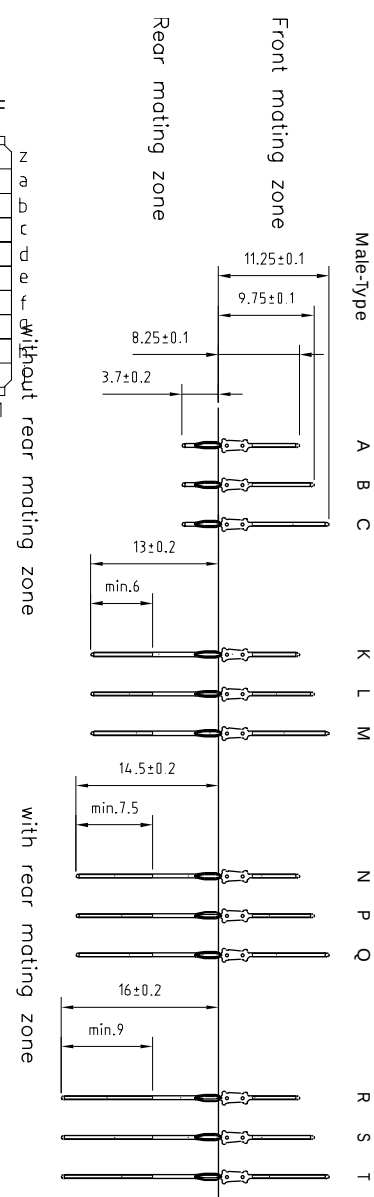
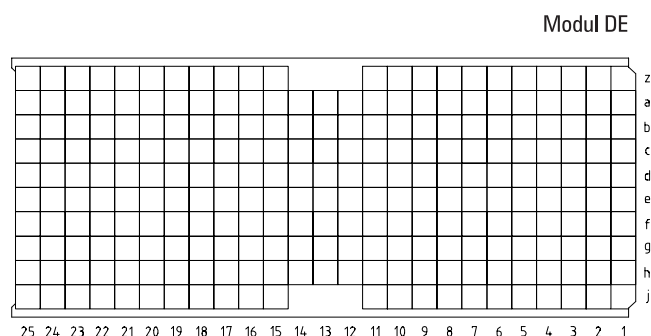
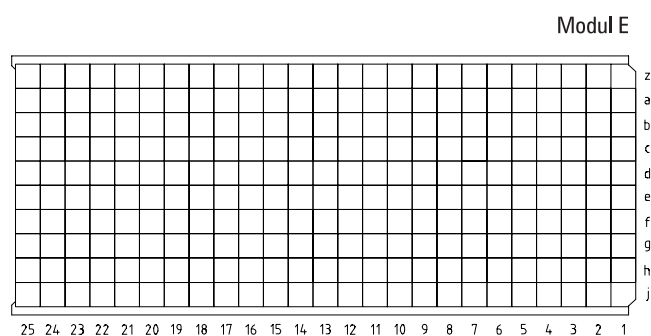
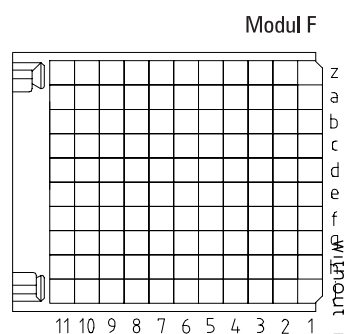
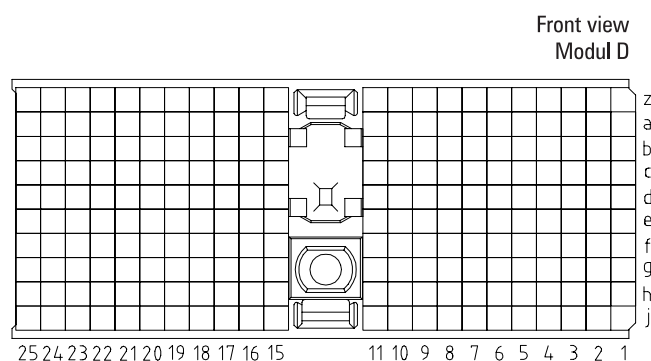


Fax request (8+2)

Company															Phone Number																													
First Name										Last Name										Fax Number																								
Adress																														E-Mail														
Adress																														Signature														

Please quote me for _____ pieces.

Please send me _____ sample pieces.



Assembly reference:

In order to be able to load the connectors economically we recommend a serial determination of the contact length. If only position 1 of a line is indicated, the entire line is loaded with this contact length. Exceptions can be registered at the respective position.

Surface:

Quality level 2 acc. to IEC 61076-4-101.

Au over PdNi over Ni.

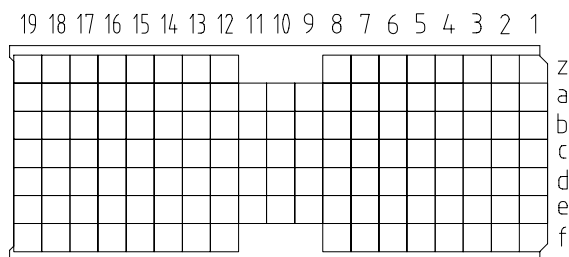
Fax request AB

Company		Phone Number
First Name	Last Name	Fax Number
Address		E-Mail
Address		Signature

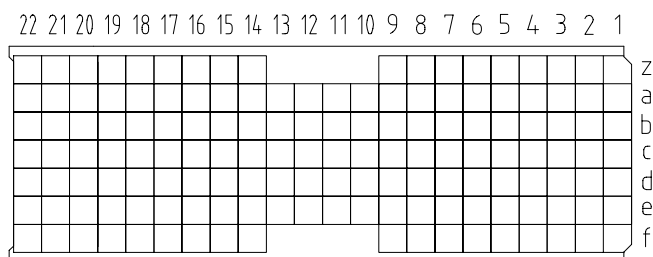
Please quote me for _____ pieces.

Please send me _____ sample pieces.

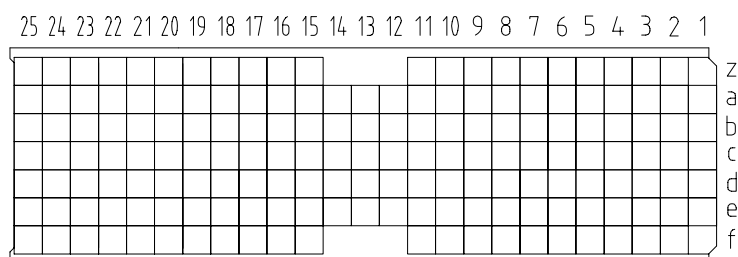
Front view
Modul AB-19



Modul AB-22



Modul AB-25



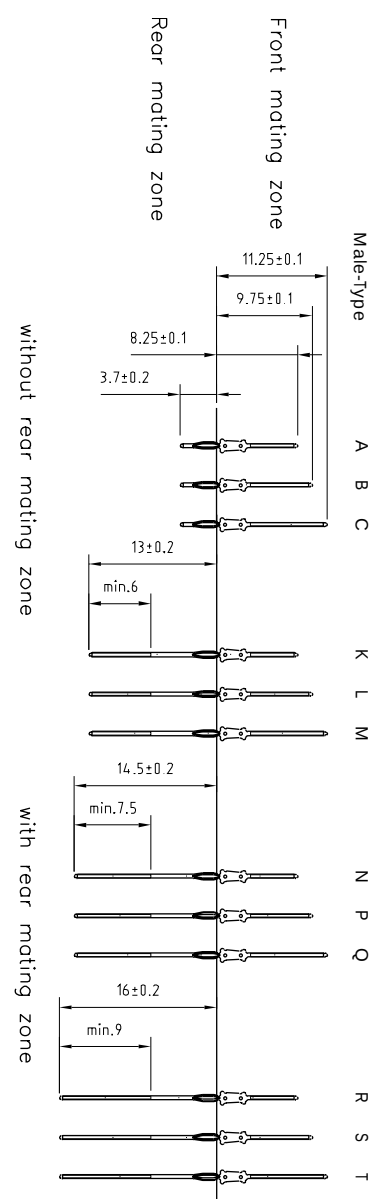
Assembly reference:

In order to be able to load the connectors economically we recommend a serial determination of the contact length. If only position 1 of a line is indicated, the entire line is loaded with this contact length. Exceptions can be registered at the respective position.

Surface:

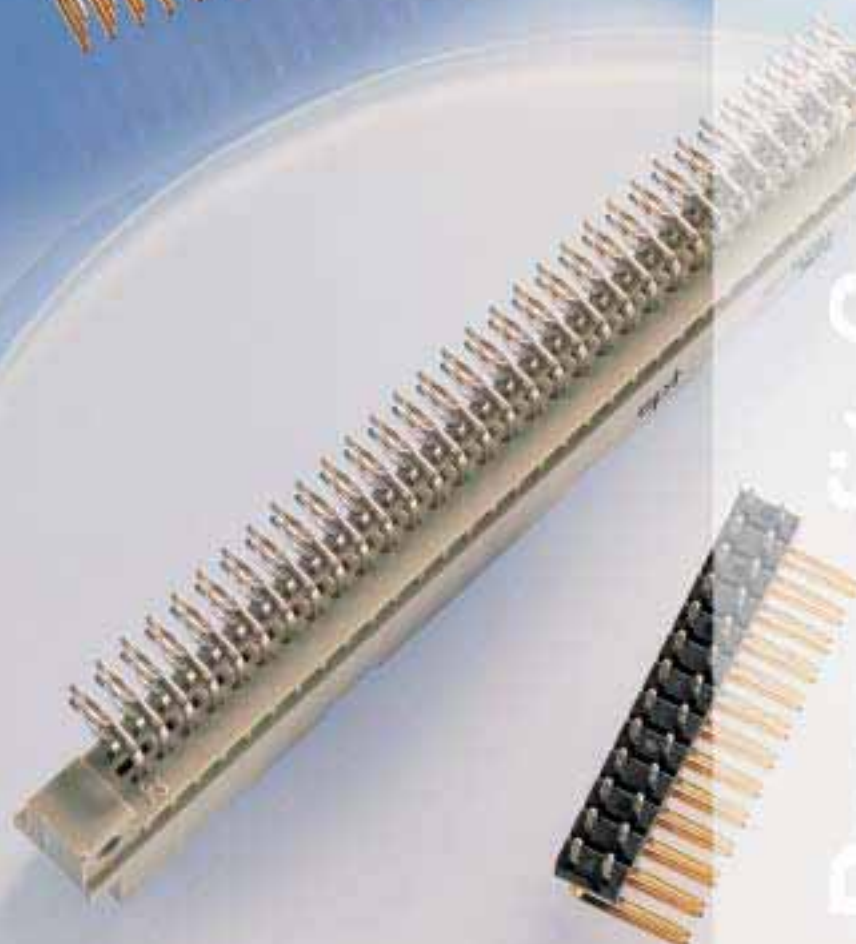
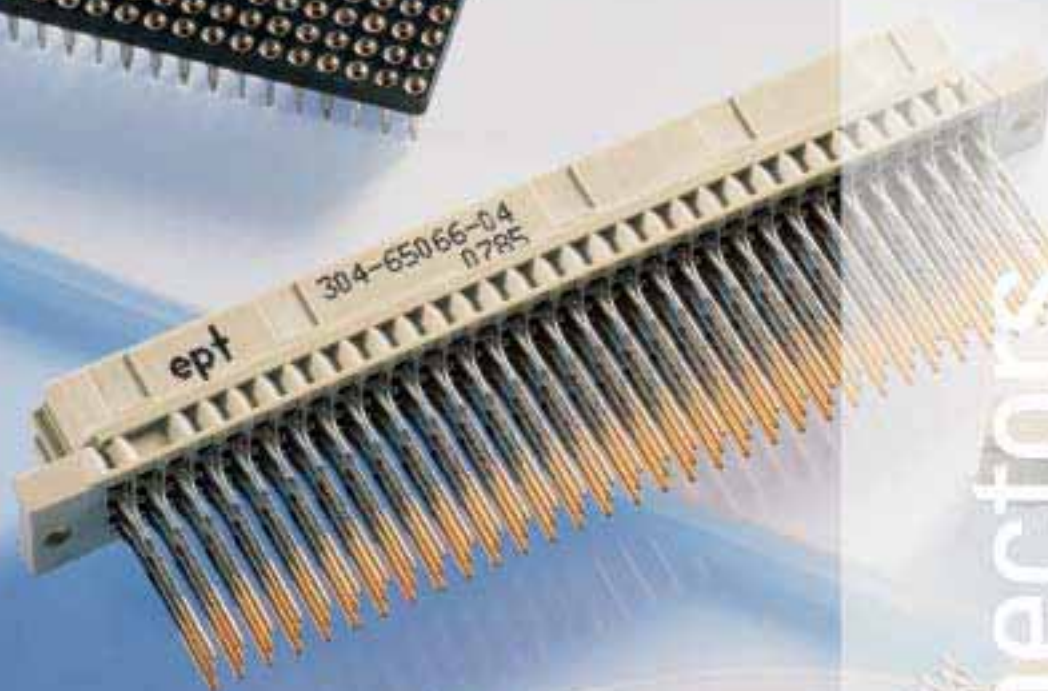
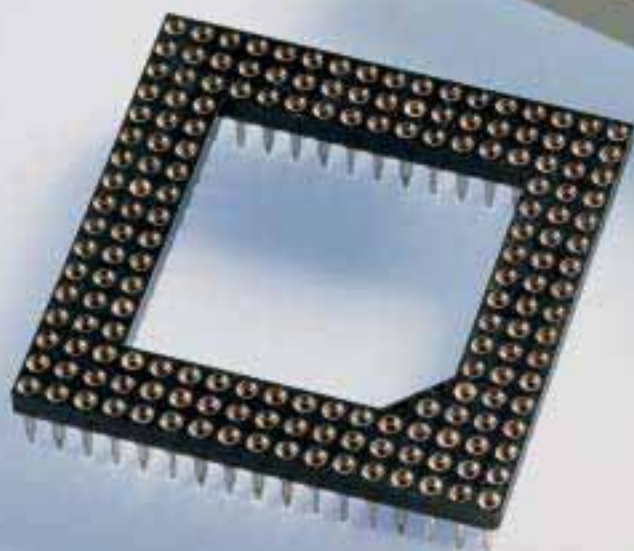
Quality level 2 acc. to IEC 61076-4-101.

Au over PdNi over Ni.



ept

the better connection



Press-fit Connectors

68014
08875

Types acc. 60603-2			B, B/2, B/3	C, C/2, C/3	D	E	F	G	H	
Reversed Type				R, R/2, R/3						
maximum Position			64 / 32 / 20	96 / 48 / 30	32	48	48	64	11	15
Description of Contact rows for male and female Connectors			a b	a b c	a c	a c e	z b d	z b d f	b	z d
Temperature Range			- 55 °C ... + 125 °C						- 65 °C ... + 125 °C	
Creepage (C) and Air Gap (A) in mm	within on Row	C	1,2 mm	3,0 mm		3,0 mm	3,0 mm	8,0 mm	8,0 mm	
		A	1,2 mm	3,0 mm		1,6 mm	1,6 mm	4,5 mm	4,5 mm	
	between Rows	C	1,2 mm	3,0 mm		3,0 mm	3,0 mm	8,0 mm	8,0 mm	
		A	1,2 mm	3,0 mm		1,6 mm	1,6 mm	4,5 mm	4,5 mm	
Current Carrying Capacity per Contact	I		see illustration page 10							
	at 20 °C		1,5 A	5,6 A				15 A		
	at 70 °C		1,1 A	4,0 A				11 A		
	at 100 °C		0,7 A	2,5 A				8 A		
Test Voltage, 50 Hz, 1 min.										
Contact/Contact	Ueff		1000 V	1550 V		1550 V	1550 V	3100 V		
Contact/Earth	Ueff		1550 V	1550 V		2500 V	2500 V	3100 V		
Termination Resistance	R		< 0,02 W	< 0,015 W				< 0,008 W		
Insulation Resistance	R		> 10 ¹² W							
Mechanical Durability acc. DIN EN 60603-2			Quality Level I = 500 mating cycles							
			Quality Level II = 400 mating cycles							
			Quality Level III = 50 mating cycles							
Total Insertion- and Extraction Force	F	64 pol.<60 N 96 pol.<90 N		< 40 N	< 60 N	< 75 N	< 100 N	< 80 N	< 90 N	
		32 pol.<30 N 48 pol.<45 N								
		20 pol.<18 N 30 pol.<28 N								
Extraction Force per Contact	F	> 0,15 N				> 0,2 N				
Contacts			Double Contact							
Housing			PBTP 30% GV, self extinguishing acc. UL 94V-0 PC 30% GV, self extinguishing acc. UL 94V-1							

UL and CSA approval on record.

Specifications

Type		SIP -Socket	VarPol Pin Connector	VarPol Female Connector
maximum Positions		50/100	54/108	54/108
Temperature Range		-55°C ... +125°C		
Creepage and Air Gaps	C/A	> 0,6 mm	> 1,2 mm	
Operating Current	I	1 A		
Operating Voltage	U	100 V / 150 VDC		
Breakeadown Voltage	U	> 1000 V		
Termination Resistance	R	< 0,01 Ohm	< 0,02 Ohm	
Insulation Resistance	R	> 10 ¹² Ohm		
typ. Insertion Force	F	1,8 N	0,9 N	
typ. Extraction Force	F	1 N		
Surface Contact Clip		2 - 3µm Ni 0,25µm or 0,75µm Au		
Mechanical Durability			400 = Qual. II 50 = Qual. III	
Surface Contact			2 = nom. 0,8µm Au over 3µm Ni 3 = nom. 0,15µm Au over 3µm Ni 4 = 3,5µm Sn over 3µm Ni	
Surface Tcom		Sn over Ni	SnPb	

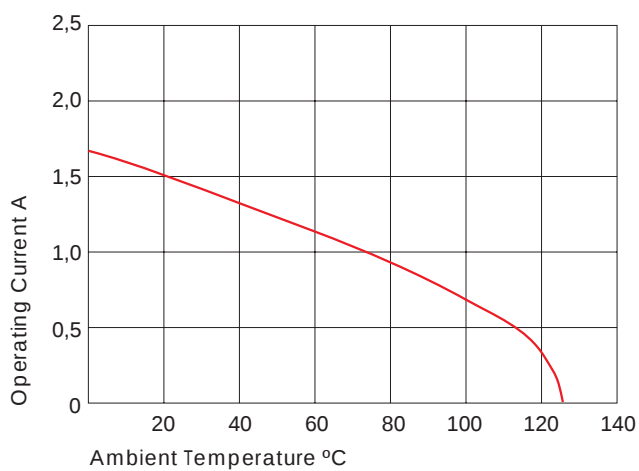
Press-in force for all connectors with ept Tcom press-fit zone:

typical: 60 N/pin

upper limit: 150 N/pin

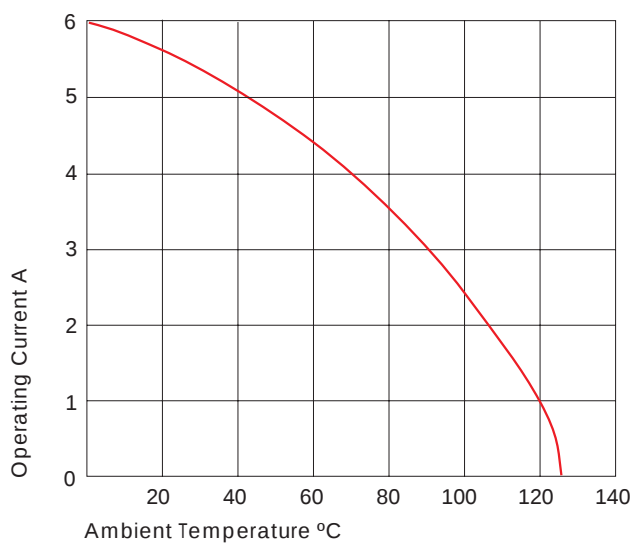
Type		VME 64x	
maximum Positions		160	
Description of Contact rows for female connector		z a b c d	
Temperatur Range		-55°C ... +125 °C	
Creepage (C) and Air Gap (A) in mm		row a, b, c	row z, d
	within on row	C	1,2
		A	1,0
	between rows	C	1,2
		A	1,2
Current	I		
Carrying Capacity per Contact	At 20°C		1,5 A
	At 70°C		1,1 A
	At 100°C		0,7 A
Test Voltage, 50 Hz, 1 min.			
Contact / Contact	Ueff	1000 V	
Contact / Earth	Ueff	1550 V	
Termination Resistance	R	< 0,02 Ohm	
Insulation Resistance	R	> 10 ¹² Ohm	
Mechanical Durability acc. DIN EN 60603-2		Quality Level = 400 mating cycles	
Total Insertion and Extraction Force	F	160 pol. = 160 N	
Extraction Force per Contact	F	> 0,15 N	
Contacts		Double Contact	
Housing		PBTP 30%, self extinguising acc. UL 94 V-0	

Derating curve



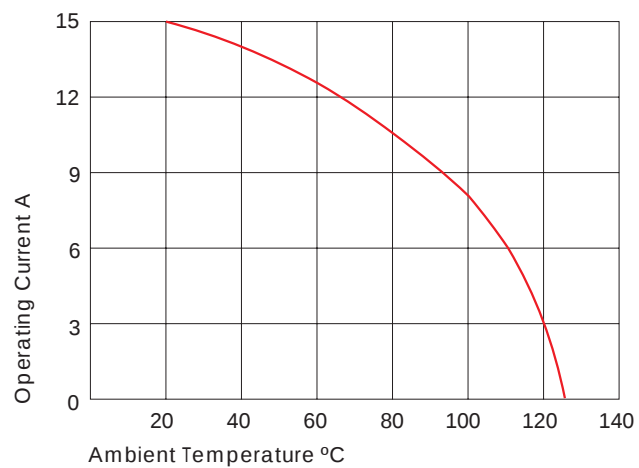
Type B, C, R

20°C	1,5 A
70°C	1,1 A
100°C	0,7 A



Type D, E, F, G

20°C	5,6 A
70°C	4,0 A
100°C	2,5 A

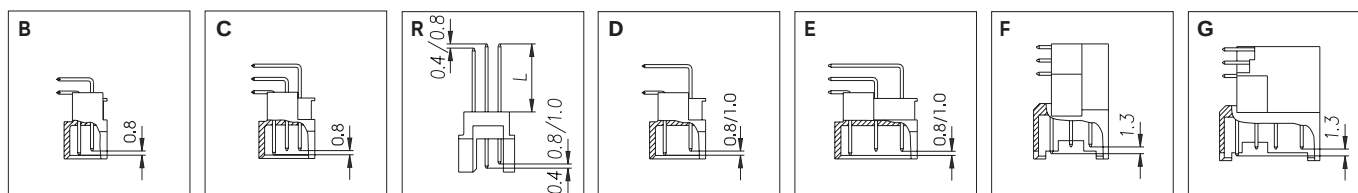
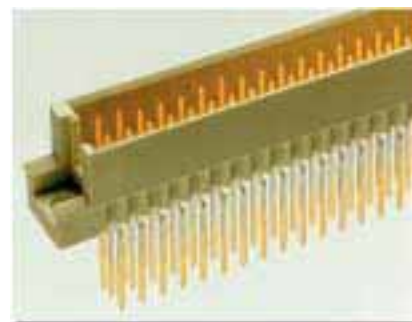


Type H11

20°C	15 A
70°C	11 A
100°C	8 A

Pre-mating/late-mating male contact pin for Type B, C, R, D, E, F, G

Premating contacts can be loaded in any position upon request.



Dimensions in [mm]

Type		Standard	Premating contact		Late mate contact	
			+0,8 mm	+1,0 mm	-0,4 mm	-0,8 mm
B, B/2, B/3, C, C/2, C/3		4,9 ±0,1		5,9 ±0,1		4,1±0,1
R, R/2,R/3	Mating side	4,9 ±0,1	5,7 ±0,1	5,9 ±0,1	4,5 ±0,1	4,1 ±0,1
	Back side	13,0 ±0,1	13,8 ±0,1		12,6 ±0,1	12,2 ±0,1
D		4,9 ±0,1	5,7 ±0,1	5,9 ±0,1		
E (Spacing 2,54 mm)		4,9 ±0,1	5,7 ±0,1 Row a, c, e	5,9 ±0,1 Row a		
E (Spacing 5,08 mm)		4,9 ±0,1	5,7 ±0,1 Row a	5,9 ±0,1 Row a		
F, G		6,1 ±0,1	+1,3 = 7,4 ±0,1			

Other length on request.

Connectors acc. DIN 41612: Types B, C, R, D, E, F, G

Company		Phone
First Name	Last Name	
Adress		Fax
Adress		E-Mail
		Signature

ept-Part-No.				—						—	
--------------	--	--	--	---	--	--	--	--	--	---	--

Type B, C, R-Female Connectors

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
a																																
b																																
c																																

$\frac{1}{3}$ $\frac{1}{2}$

B, E

Type B, C, R-Male Connector		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Mating Side	a																																
	b																																
	c																																

A, B, D, E

[illegible]

Type D, E

☐ Female Connector

☐ Male Connector

	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32
a																
c																
e																

A, B

Type F, G

	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32
z																
b																
d																
f																

C

D = 0,4 mm late mate
E = 0,8 mm late mate
F = 1,0 mm late mate

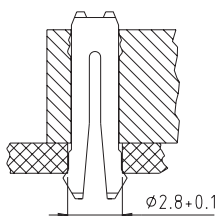
Board-Lock

As an alternative to screw or eyelet mounting of a male or female connector to the PCB, it is also possible to mount connectors by means of board-locks pre-inserted in the connector mounting holes.

The connector with a board-lock is pressed onto the PCB and fixed into the mounting hole of the PCB by spring action of the board-lock.

The force of the spring contact is sufficient to hold the connector in place during the solder process. For drilled through mounting holes, the holding force of the connector is significantly increased by soldering of the board-locks during the solder process.

Type B, C, D, E, F, G-Male Connectors and Type R-Female Connectors



Board-Lock: stamped

Force	F_m	not soldered F_h	soldered F_h
mating operation			
inserted	<30 N	>10 N	>20 N
under tension	<30 N	>7,5 N	>20 N

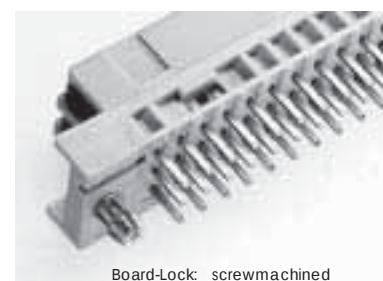
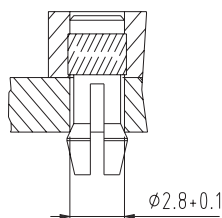
F_m : max. assembly force / board-lock

F_h : min. holding force / board-lock

PCB-thickness	Part Numbers
1,6 mm	xxx-xxxxxC1
2,4 mm	xxx-xxxxxC2
3,6 mm	xxx-xxxxxC3

Ordering example: C-MC/PCB 1,6 mm Part No. 103-40017C1

Type B, C, D, E, F-low profil Female connectors and Type R-Male connectors



Board-Lock: screwmachined

Force	F_m	not soldered F_h	soldered F_h
mating operation			
inserted	<20 N	>10 N	>25 N
under tension	<20 N	>5 N	>25 N

F_m : max. assembly force / board-lock

F_h : min. holding force / board-lock

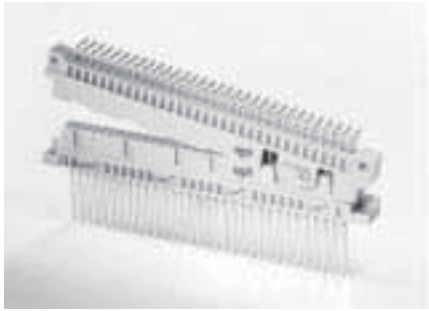
PCB-thickness	Part Numbers
1,6 mm	xxx-xxxxxC1
2,4 mm	xxx-xxxxxC2
3,6 mm	xxx-xxxxxC3

Ordering example: C-FC/PCB 1,6 mm Part No. 104-40017C1

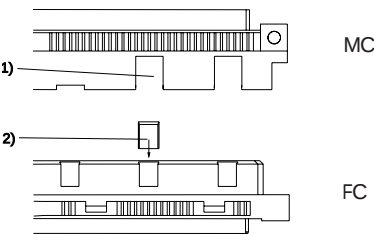
Keying without loss contacts

Type B and C connectors provide an integrated method for keying, in order to prevent accidental mis-inserted of modules.

To achieve the keying, insertions are set into the female contact and corresponding slots are broken out of the male connector.

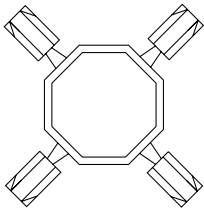


Keying



- 1) break out keying slot
- 2) place key insert into female connector

Keying star (4 keying wedges)



Part Number	104-19003
Packing unit	25 stars

Coding tool

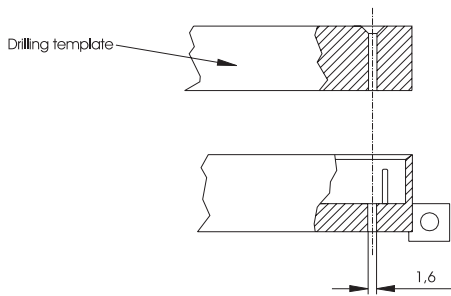


Part Number	894-301
-------------	---------

Connectors of the type D, E and F can be keyed by placing holes in the male connector and corresponding pins into the female connector.

Male Connector

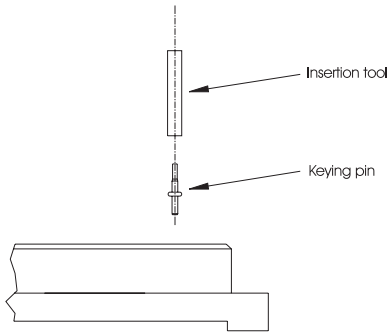
Drill keying hole.



	Part Numbers
Coding pin	106-10001
Packing unit	100 pieces

Female Connector

Place keying pin into the existing key hole with the setting tool.



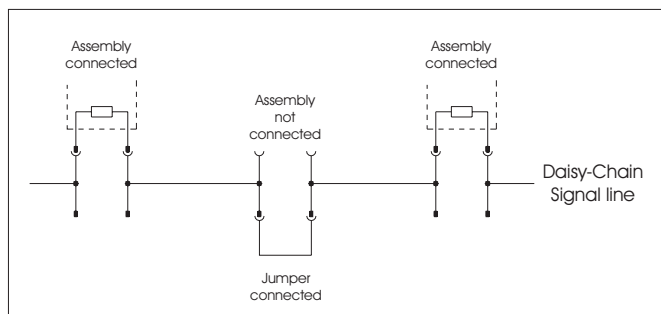
	Part Number
Set tool	894-302

Switching Connectors

Female connectors with integrated switching function.

The Problem

A commonly used principle for various bus systems is that of a common signal circuit path looped through daughter cards, known to many as "daisy chaining".



This daisy chaining creates a problem in applications when it is necessary to remove active cards from a system. The daisy chain signal path is broken and needs to be reestablished by means of jumpers inserted onto two pins on the backplane. This turns out to be rather difficult in high density backplanes and racks. Often the entire package must be disassembled, or the process turns into a nerve wracking fumbling around to place the jumpers onto the correct pins. Accidental mis-insertion onto the wrong pin pair is not uncommon.

Possible Solutions

By integrating a mechanical switching function into the standard C series IEC 60603-2 connector, an elegant and simple solution to the above described problem is now available.

The female contacts of the C female connector are expanded with tabs on both sides of each dual beam contact. A gold plated switching leaf is inserted between two side by side contacts. While there is no male connector pin inserted into the female connector contact, the female contact leaves are shut and make contact, by means of the extension tabs, onto the switching leaf. This provides an automatic closing of the daisy chain when a male connector is removed from the female connector. Upon insertion of the male contact into the dual beam female contact, the tabs are lifted from the switching leaf and the circuit path is made through the male connector and the daughter card combination.

By means of the switching action of these connectors, the daisy chaining of signal paths is automatically made continuous when a daughter card is removed from its slot on the backplane. It is possible to regard this closed contact between two female connector pins as the functional equivalent of inserting jumpers onto jumper pins. Only in this case this occurs automatically.

Specifications

Contacts	Copper alloy, sel. plated Au over 2 µm Ni	Operating Voltage	24 V~
Terminals	Tcom press	Current Proof of the Switching Contact	max. 1 A at 30° C
Housing	Polyester GV, grey, self extinguishing UL 94 V0	Switching under Power	5 V/100 mA min. 500 cycles
Temperature Range	-55 °C to +125 °C	Switchfrequency	min. 500 switching cycles
Mating Cycles	Quality Level I...III = 500...400...50	Contact Resistant	≤ 50 mΩ
Operating Current	max. 3,2 A/20 °C...2,5 A/70 °C...1,7 A/100 °C		

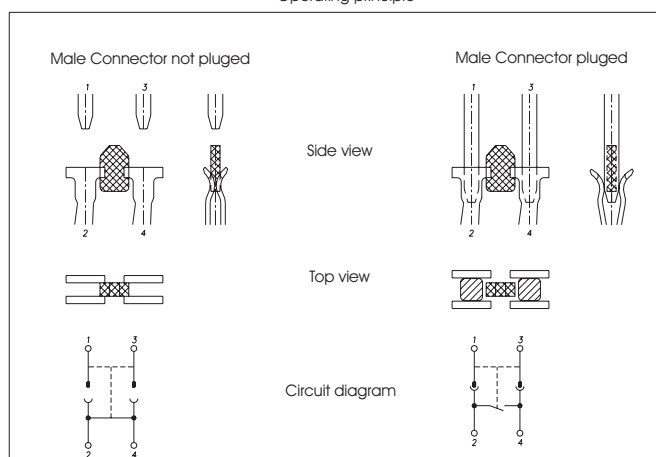
VME Bus Applications

The daisy chaining principle is used in VME bus applications for IACK and BG 0...3. By having integrated the switching function into the connector, the use of jumpers is eliminated.

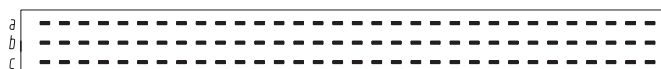
Other Applications

This integrated switching function is not restricted to the above described switching function for VME bus, or pin in row switching. A switching function can be placed between two adjacent pins in any B or C series full or half DIN connector, as well as between parallel pins in side by side rows (ie. row A pin 1 to row C pin 1 in a C series DIN connector). These switching possibilities may be an ideal solution for Ethernet Hubs or other Networking applications where uninterrupted daisy chained signal paths are a necessity.

Operating principle

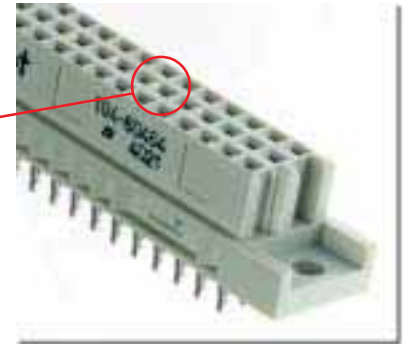


Switching between adjacent pins in one row



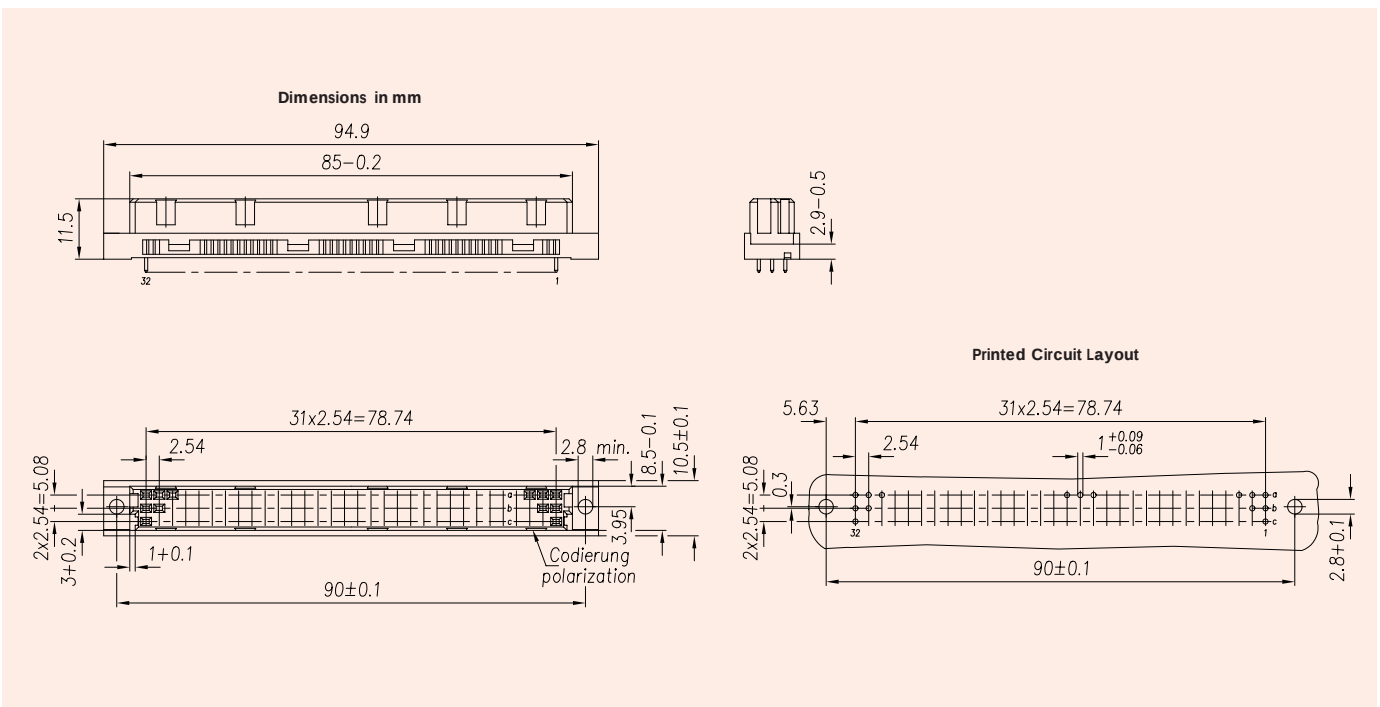
Switching between pins in side by side rows

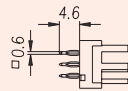
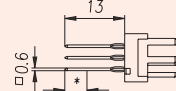
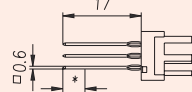




Switching Connectors (VME-Bus)

Switching function between adjacent pins in one row

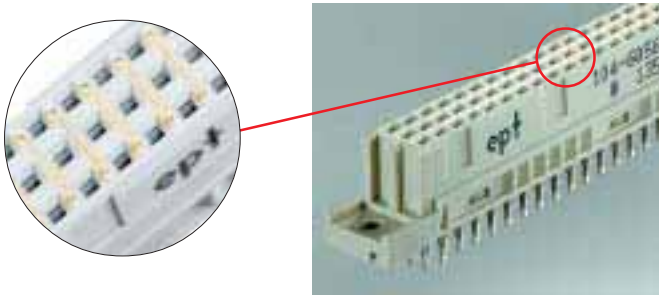


Position		96
Switching Contact at Position		a21-a22, b4-b5, b6-b7, b8-b9, b10-b11
Termination Methods	Quality Class	Part Numbers
	I	—
	II	104-60464-03
	III	—
	I	—
	II	104-65465-03
	III	—
	I	—
	II	104-65466-03
	III	—

* Terminal Au/Ni

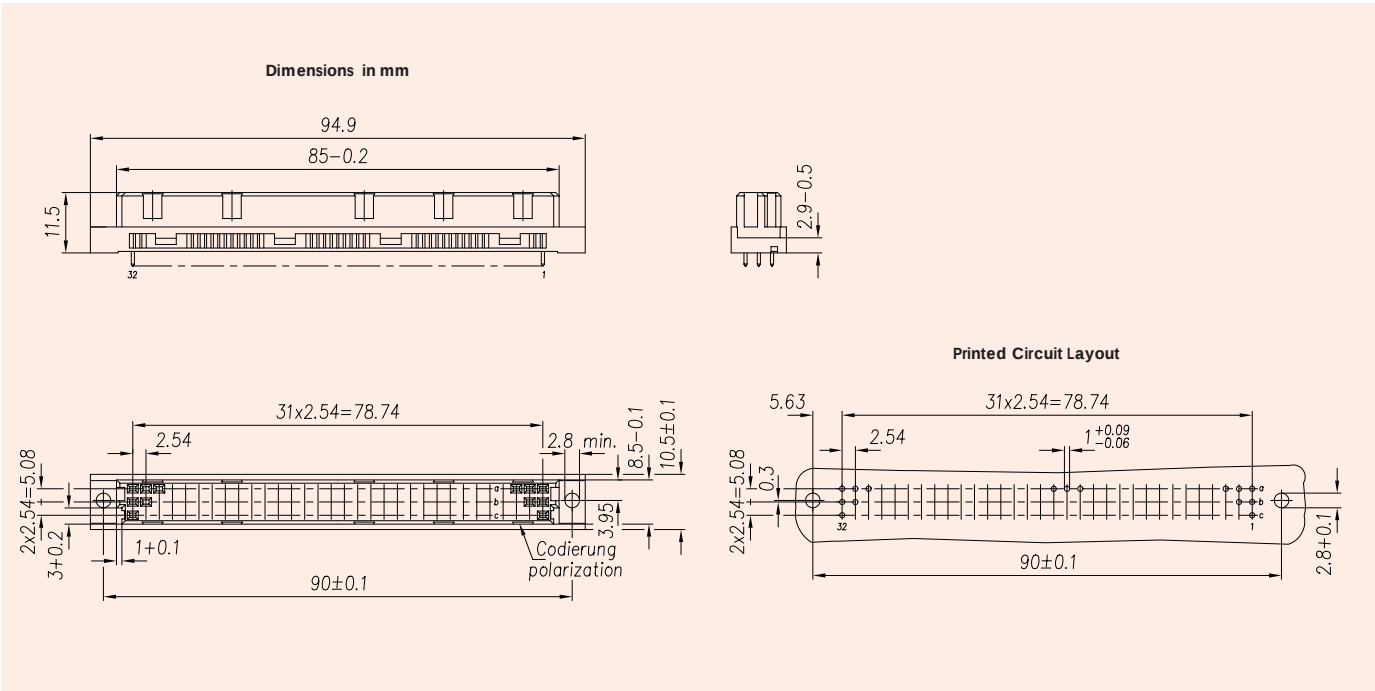
On request: with/without mounting flange — Special assembly possible

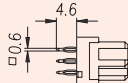
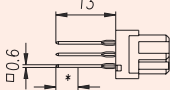
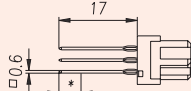
Insertion tool: Part No. 884-200



Switching Connectors

Switching function between pins in side by side rows



No. of Positions		96
Switching Contact at Position		1, 2, 3, 4,.....32 (customer request)
Termination Methods	Quality Class	Part Numbers
	I	—
	II	104-60565-03
	III	—
	I	—
	II	104-65565-03
	III	—
	I	—
	II	104-65566-03
	III	—

* Terminal Au/Ni

On request: with/without mounting flange — Special assembly possible
Insertion tool: Part No. 888-214

Fax inquiry

Female Connectors Type B, C with custom configuration for switching contacts.

Company		Phone
First Name	Last Name	Fax
Address		Signature

Connectors according to ept-catalog

Opt-Part No.

			—						—	
--	--	--	---	--	--	--	--	--	---	--

Quantity required:

Type B-Female Connectors

[illegible]

- ☐ switching contact within the row
- ☐ switching contact between row a and row c

Type C-Female Connectors

[illegible]

- ☐ switching contact within the row
- ☐ switching contact between row a and row c

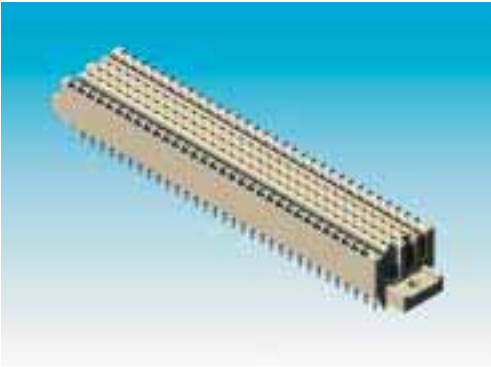
Ordering Example:

switching contact in row

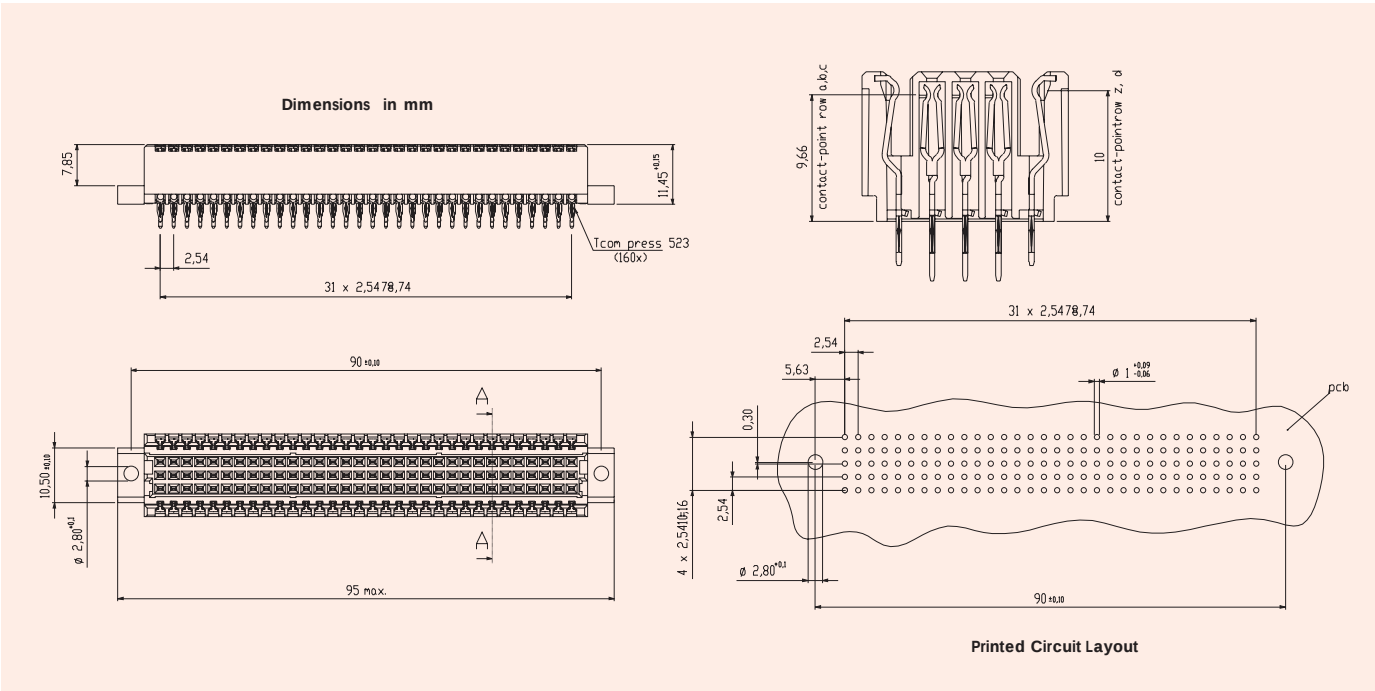
switching contact at position: a1-a2, b3-b4, b5-b6, a8-a9-a10, c8-c9

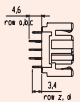
switching contact between row a and row c

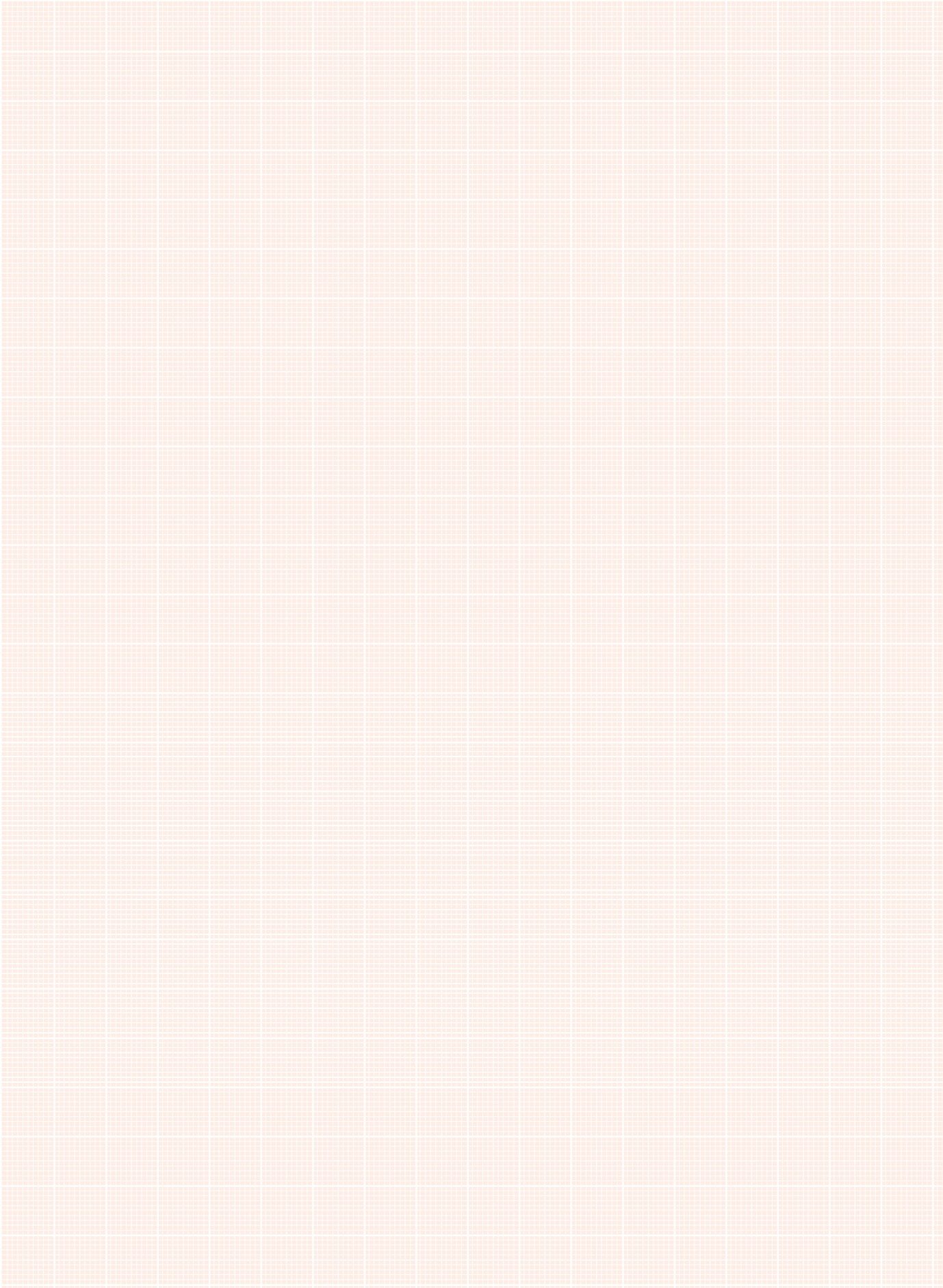
switching contact at position: a1-c1, a3-c3, a4-c4, a7-c7, a8-c8



Female Connectors Typ VME 64E



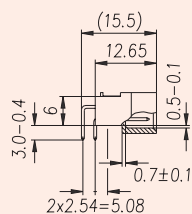
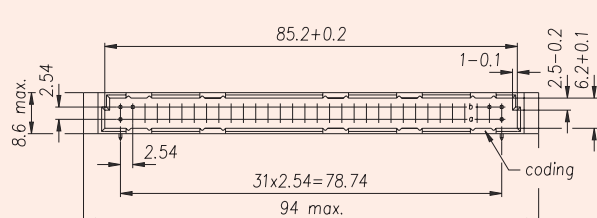
No. of Positions		160
Position		Row z,a,b,c,d
Termination Methods	Quality Class	Part Numbers
	II	306-60067-12
	II	306-65069-14



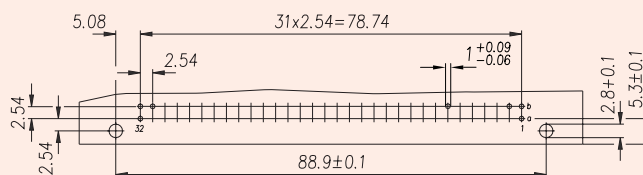
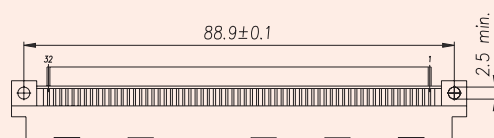


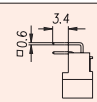
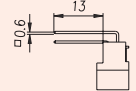
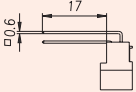
Male Connectors Type B

Dimensions in mm



Printed Circuit Layout for SnPb-PCB's



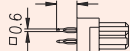
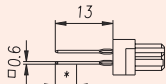
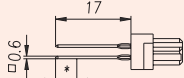
No. of Positions		32	32	64
Position		Row a	Row a,b (2,4,6,...)	Row a,b
Termination Methods	Quality Class	Part Numbers		
	II	101-60004	101-60014	101-60064
	II *	101-65005	101-65015	101-65065
	II *	101-65006	101-65016	101-65066

* Contact area Au/Ni / Terminals SnPb Part No. 101-60...

On request: First mate last break contacts — Special assembly possible — other quality class possible

Insertion tool: Part No. 884-150



No. of Positions		32	32	64
Position		Row a	Row a,b (2,4,6,...)	Row a,b
Termination Methods	Quality Class	Part Numbers		
	II	102-63014-xx	102-63024-xx	102-63064-xx
	II	102-65015-xx	102-65025-xx	102-65065-xx
	II	102-65016-xx	102-65026-xx	102-65066-xx

On request: with/without mounting flange — Special assembly possible — Pin length to customer request — other quality class possible

Insertion tool: Part No. **884-100**

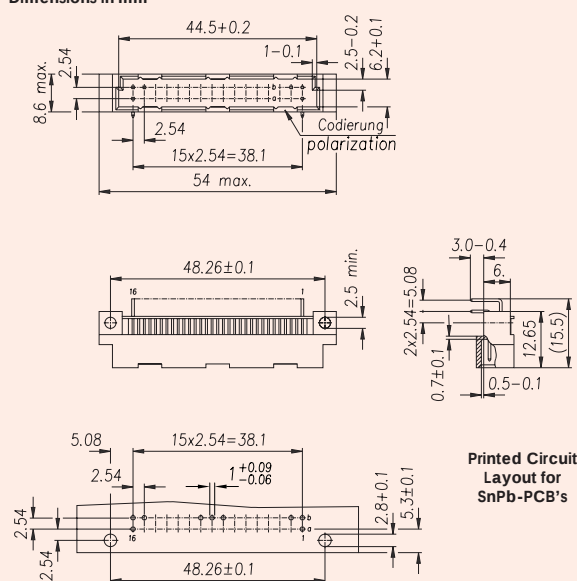
PCB-thickness: PCB 1.5 ... 2.0 mm = xxx-xxxxx-**01** with X=3,2 mm
PCB 2.0 ... 2.8 mm = xxx-xxxxx-**02** with X=4,6 mm
PCB > 2.8 mm = xxx-xxxxx-**03** with X=4,6 mm



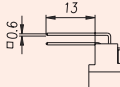
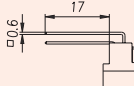
Type B/2

Male Connectors

Dimensions in mm



Printed Circuit Layout for SnPb-PCB's

No. of Positions		16	32
Position		Row a,b (2,4,6,...)	Row a,b
Termination Methods	Quality Class	Part Numbers	
	II	101-69004	101-69014
	II	101-79006	101-79016
	II	101-79106	101-79116

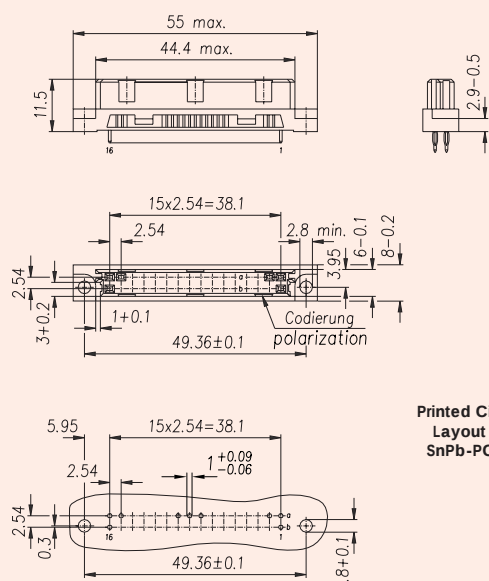
* Contact area Au/Ni / Terminals SnPb Part No. 101-69...

On request: First mate late breake contacts — Special assembly possible —
other quality class possible

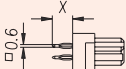
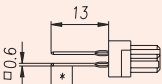
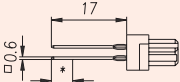
Insertion tool: Part No. **884-151**

Female Connectors

Dimensions in mm



Printed Circuit Layout for SnPb-PCB's

No. of Positions		16	32
Position		Row a,b (2,4,6,...)	Row a,b
Termination Methods	Quality Class	Part Numbers	
	II	102-69004-xx	102-69064-xx
	II	102-79006-xx	102-79066-xx
	II	102-79106-xx	102-79166-xx

* Contact area Au/Ni / Terminals SnPb Part No. 102-69...-xx — xx see page 1.12

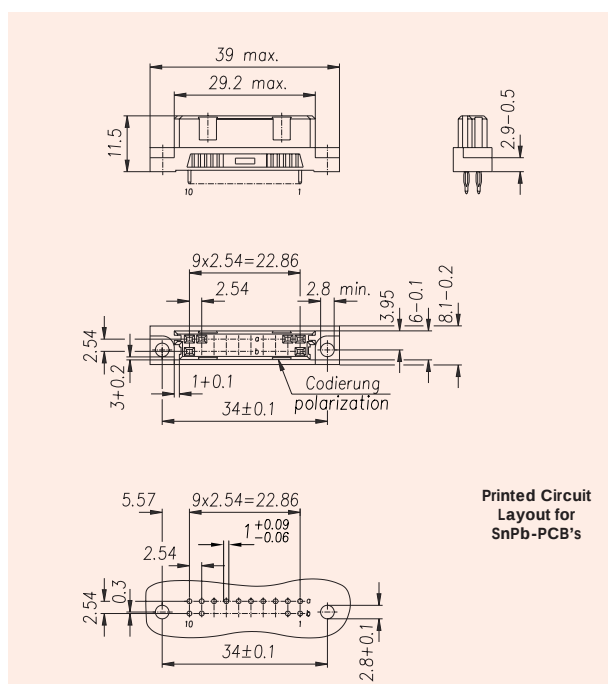
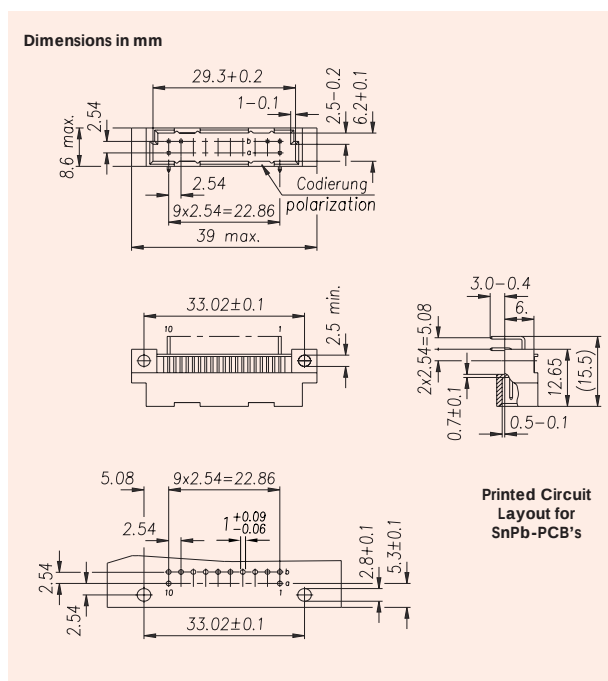
On request: with/without mounting flange — Special assembly possible —
Pin length to customer request — other quality class possible

Insertion tool: Part No. **884-101**

PCB-thickness: PCB 1.5 ... 2.0 mm = xxx-xxxxx-**01** with X=3,2 mm
PCB 2.0 ... 2.8 mm = xxx-xxxxx-**02** with X=4,6 mm
PCB > 2.8 mm = xxx-xxxxx-**03** with X=4,6 mm



Type B/3



Male Connectors

No. of Positions		20
Position		Row a,b
Termination Methods	Quality Class	Part Numbers
	II	101-68014
	II *	101-78016
	II *	101-78116

* Contact area Au/Ni / Terminals SnPb Part No. 101-68...

On request: First mate last break contacts — Special assembly possible — other quality class possible

Insertion tool: Part No. 884-152

Female Connectors

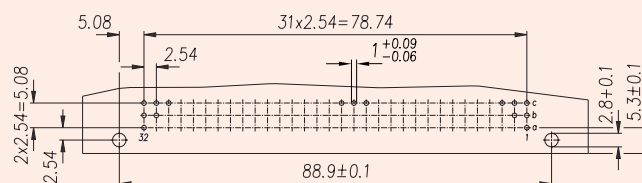
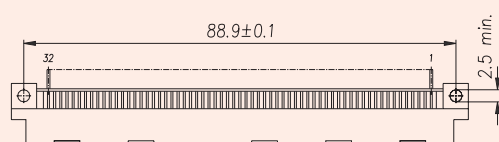
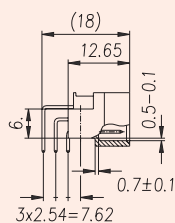
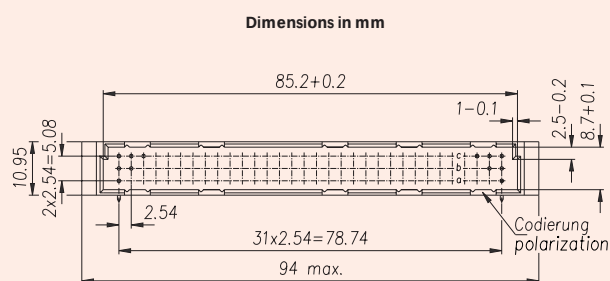
No. of Positions		20
Position		Row a,b
Termination Methods	Quality Class	Part Numbers
	II	102-68014-xx
	II	102-78016-xx
	II	102-78116-xx

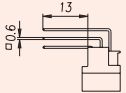
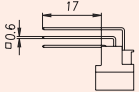
* Contact area Au/Ni / Terminals SnPb Part No. 102-68...-xx — xx see page 1.12

On request: with/without mounting flange — Special assembly possible — Pin length to customer request — other quality class possible

Insertion tool: Part No. 884-102

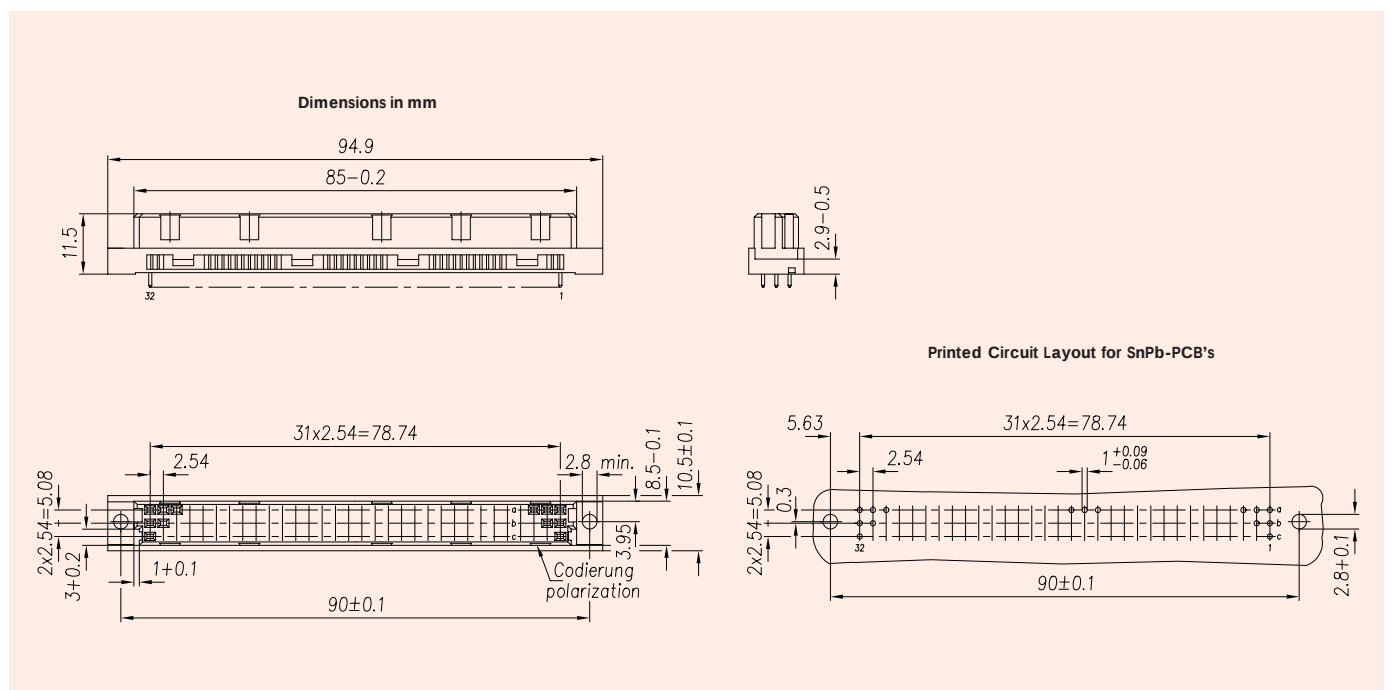
PCB-thickness: PCB 1.5 ... 2.0 mm = xxx-xxxxx-01 with X=3,2 mm
PCB 2.0 ... 2.8 mm = xxx-xxxxx-02 with X=4,6 mm
PCB > 2.8 mm = xxx-xxxxx-03 with X=4,6 mm



No. of Positions		32	48	64	96
Position		Row a,c (2,4,6,...)	Row a,b,c (2,4,6,...)	Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers			
	II	103-60014	103-60044	103-60054	103-60064
	II *	103-65015	103-65045	103-65055	103-65065
	II *	103-65016	103-65046	103-65056	103-65066



Female Connectors Type C



No. of Positions		32	48	64	96
Position		Row a,c (2,4,6,...)	Row a,b,c (2,4,6,...)	Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers			
	II	104-60014-xx	104-60044-xx	104-60054-xx	104-60064-xx
	II	104-65015-xx	104-65045-xx	104-65055-xx	104-65065-xx
	II	104-65016-xx	104-65046-xx	104-65056-xx	104-65066-xx

* Contact area Au/Ni / Terminals SnPb Part No. 104-60...-xx — xx (see page 1.12) chapter "techn. Notes/PCB warping"

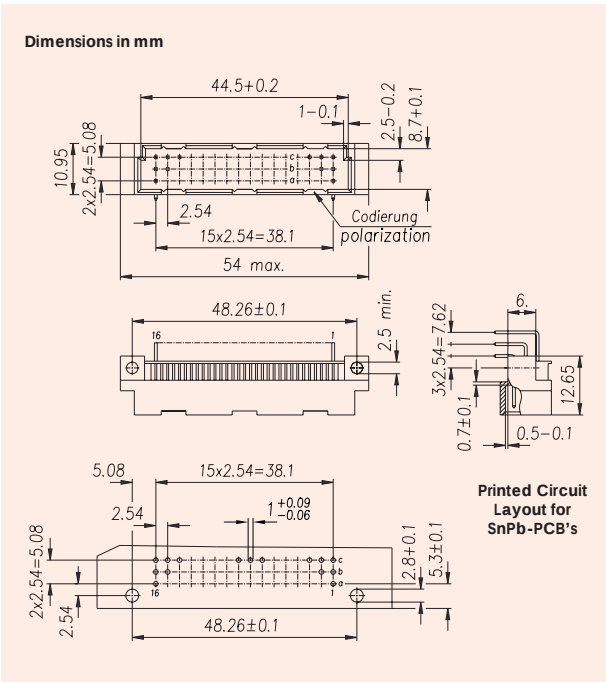
On request: with/without mounting flange — Special assembly possible — Pin length to customer request — other quality class possible

Insertion tool: Part No. **884-200**

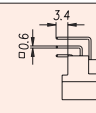
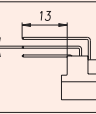
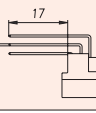
PCB-thickness:
PCB 1.5 ... 2.0 mm = xxx-xxxxx-**01** with X=3,2 mm
PCB 2.0 ... 2.8 mm = xxx-xxxxx-**02** with X=4,6 mm
PCB > 2.8 mm = xxx-xxxxx-**03** with X=4,6 mm



Type C/2



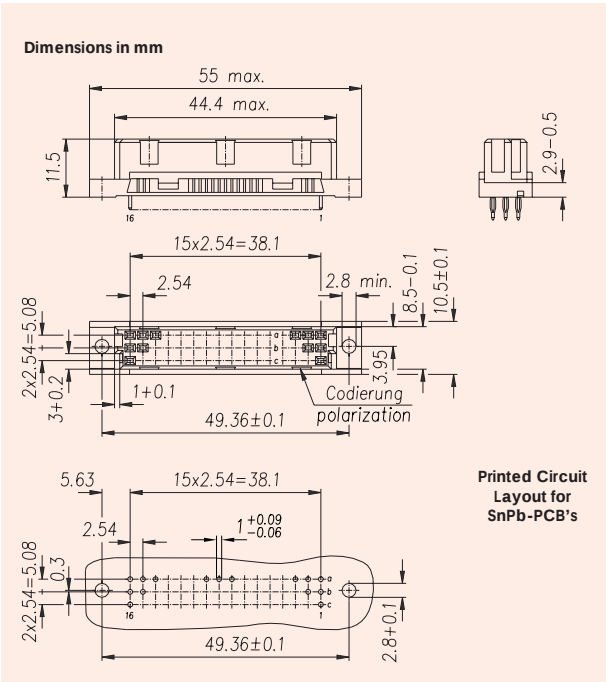
Male Connectors

No. of Positions		16	32	48
Position		Row a,c (2,4,6)	Row a,c	Row a,b,c
Termination Methods	Quality	Part Numbers		
	II	103-69004	103-69014	103-69064
	II	103-79006	103-79016	103-79066
	II	103-79106	103-79116	103-79166

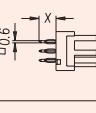
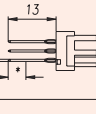
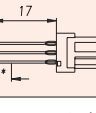
* Contact area Au/Ni / Terminals SnPb Part No. 103-69...

On request: First mate last break contacts — Special assembly possible — other quality class possible

Insertion tool: Part No. **884-251**



Female Connectors

No. of Position		16
Position		Row a,c (2,4,6)
Termination Methods	Quality	Part Numbers
	II	104-69004-xx
	II	104-79006-xx
	II	104-79106-xx

* Contact area Au/Ni / Terminals SnPb Part No. 104-69... — xx see page 1.12

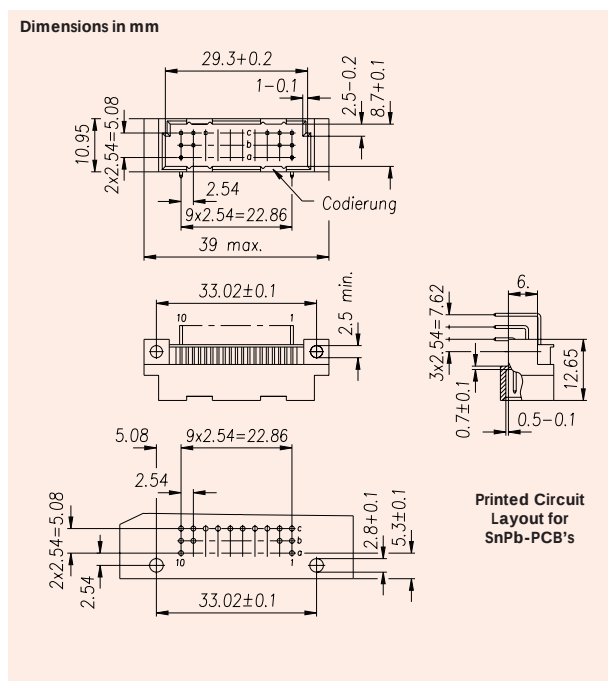
On request: with/without mounting flange — Special assembly possible — pin length to customer request — other quality class possible

Insertion tool: Part No. **884-201**

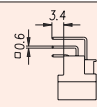
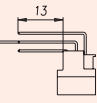
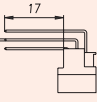
PCB-thickness: PCB 1.5 ... 2.0 mm = xxx-xxxxx-**01** with X=3,2 mm
PCB 2.0 ... 2.8 mm = xxx-xxxxx-**02** with X=4,6 mm
PCB > 2.8 mm = xxx-xxxxx-**03** with X=4,6 mm



Type C/3



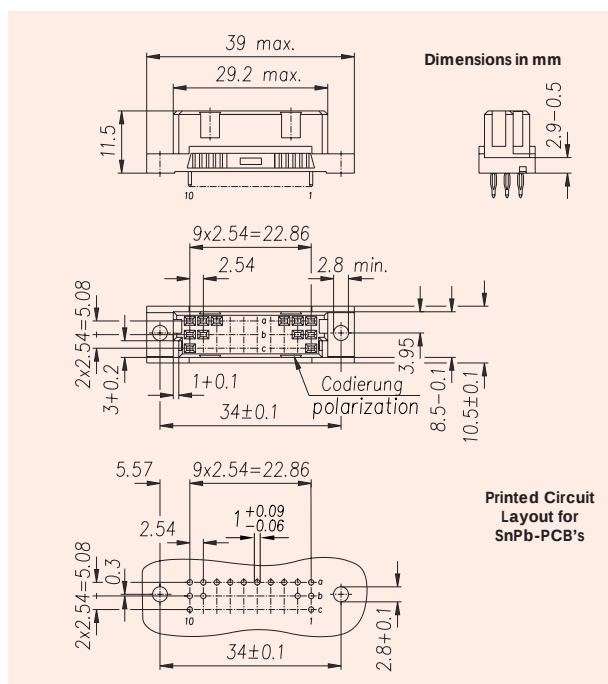
Male Connectors

No. of Positions		20	30
Position		Row a,c	Row a,b,c
Termination Methods	Quality	Part Numbers	
	II	103-68004	103-68014
	II	103-78006	103-78016
	II	103-78106	103-78116

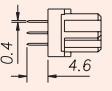
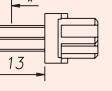
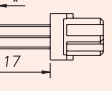
* Contact area Au/Ni / Terminals SnPb Part No. 103-68...

On request: First mate last break contacts — Special assembly possible — other quality class possible

Insertion tool: Part No. 884-252



Female Connectors

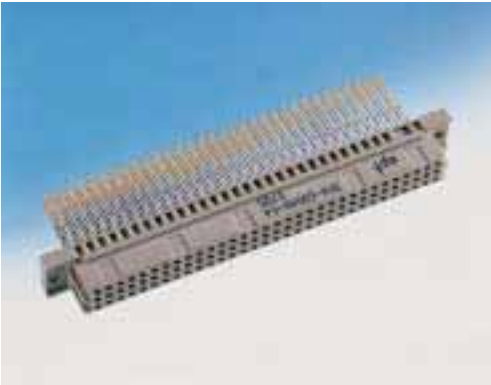
No. of Positions		20	30
Position		Row a,c	Row a,b,c
Termination Methods	Quality	Part Numbers	
	II	104-68004-xx	104-68014-xx
	II	104-78006-xx	104-78016-xx
	II	104-78106-xx	104-78116-xx

* Contact area Au/Ni / Terminals SnPb Part No. 104-69... — xx see page 1.12

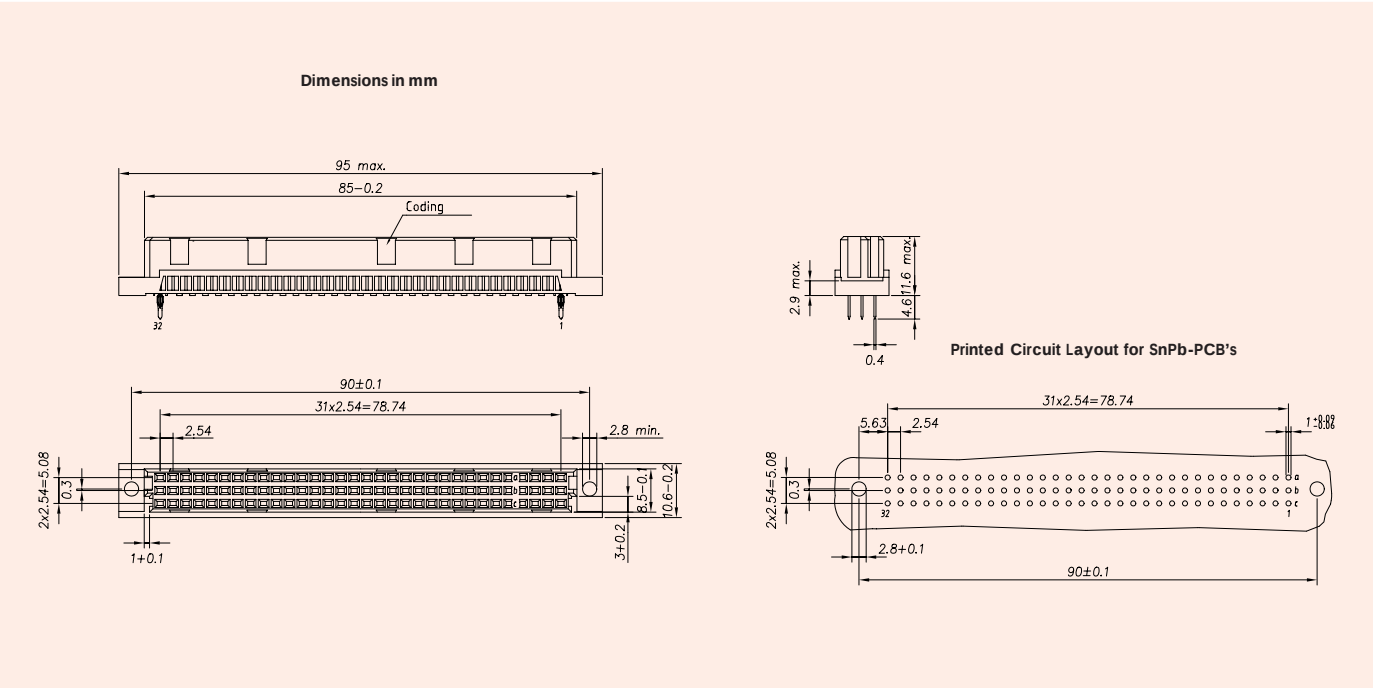
On request: with/without mounting flange — Special assembly possible — pin length to customer request — other quality class possible

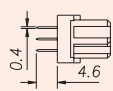
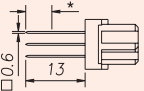
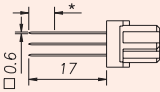
Insertion tool: Part No. 884-201

PCB-thickness: PCB 1.5 ... 2.0 mm = xxx-xxxxx-01 with X=3,2 mm
 PCB 2.0 ... 2.8 mm = xxx-xxxxx-02 with X=4,6 mm
 PCB > 2.8 mm = xxx-xxxxx-03 with X=4,6 mm



Female Connectors Type C Flat Rock

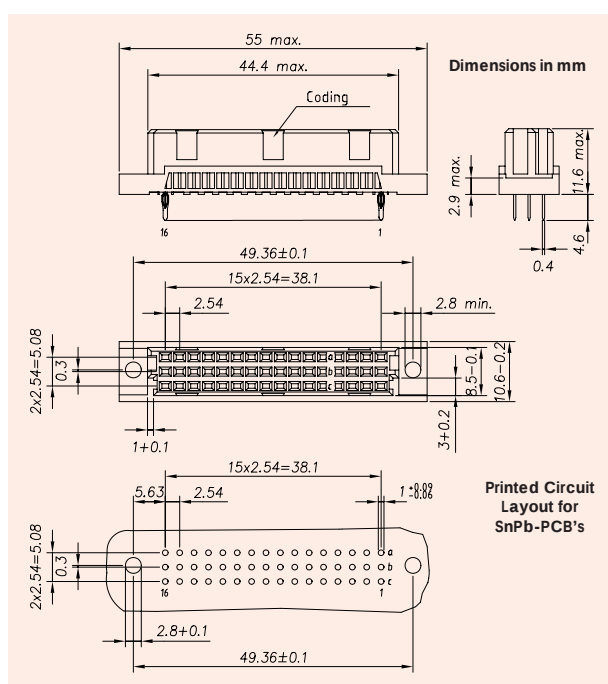


No. of Positions		64	96
Position		Row a, c	Row a, b, c
Termination Methods	Quality Class	Part Numbers	
	II	304-60054-02	304-60064-02
	II	304-65055-03	304-65065-03
	II	304-65056-04	304-65066-04

* Contact area Au/Ni / Terminals SnPb Part Number 304-60...-xx
On request: without mounting flange — Pin length to customer request
Insertion tool: Part Number 886-900-W1



Female Connectors Type C/2 Flat Rock



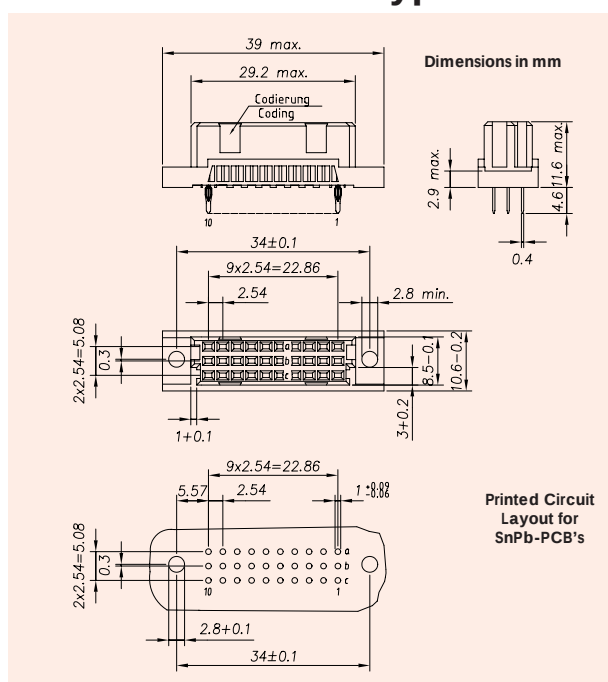
No. of Positions		32	48
Position		Row a,c	Row a,b,c
Termination Methods	Quality	Part Numbers	
	II	304-69014-02	304-69064-02
	II	304-79016-03	304-79066-03
	II	304-79116-04	304-79166-04

* Contact area Au/Ni / Terminals SnPb Part Number 304-69...-.

On request: without mounting flange — Pin length to customer request

Insertion tool: Part Number 886-900-W1

Female Connectors Type C/3 Flat Rock



No. of Positions		20	30
Position		Row a,c	Row a,b,c
Termination Methods	Quality	Part Numbers	
	II	304-68004-02	304-68014-02
	II	304-78006-03	304-78016-03
	II	304-78106-04	304-78116-04

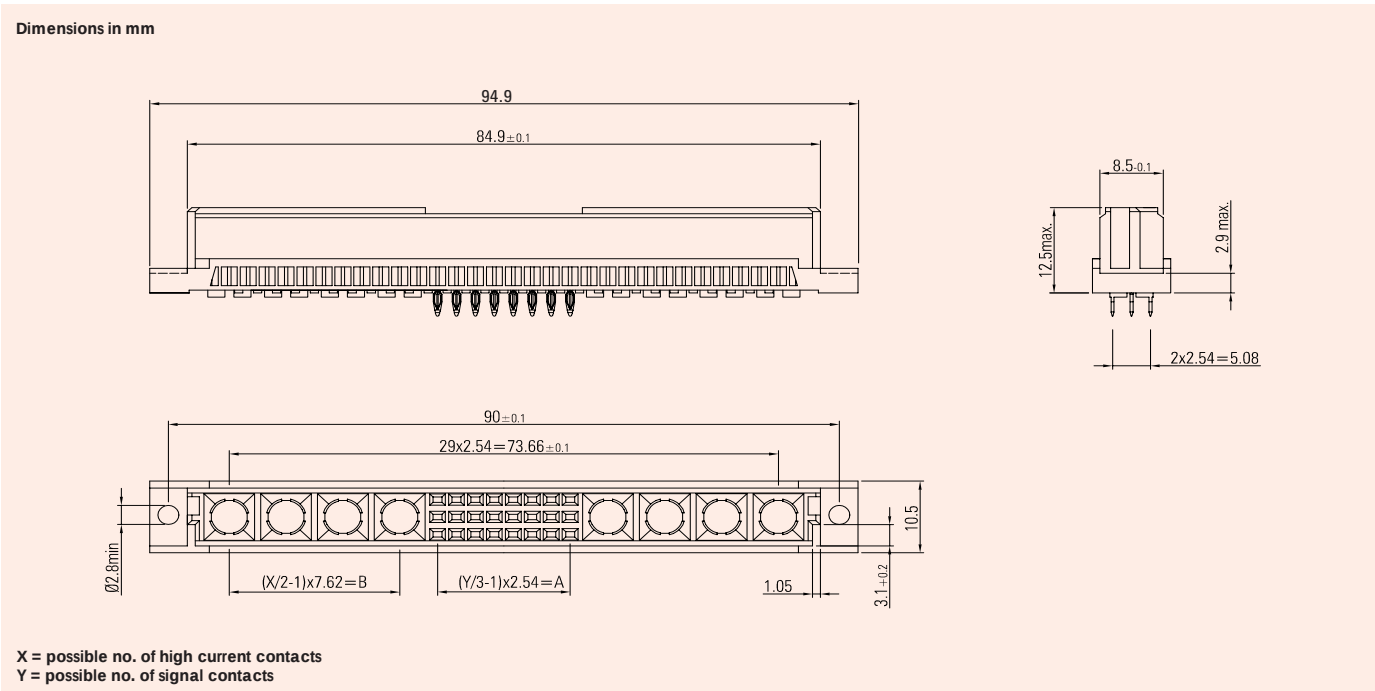
* Contact area Au/Ni / Terminals SnPb Part Number 304-68...-.

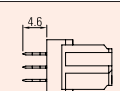
On request: without mounting flange — Pin length to customer request

Insertion tool: Part Number 886-900-W1

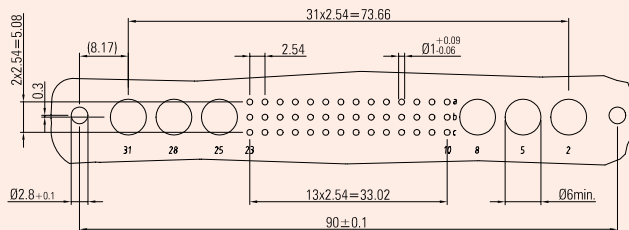
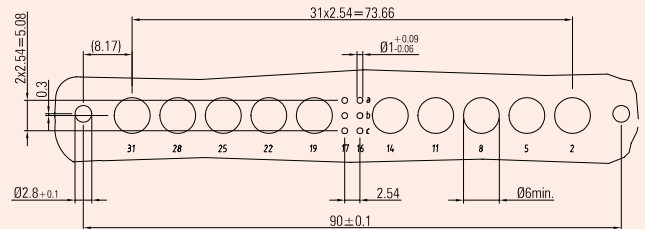
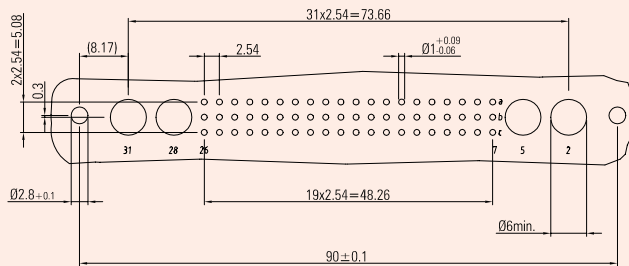
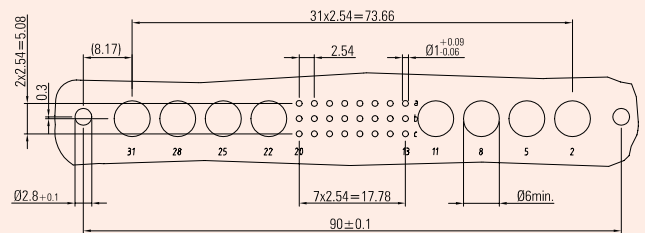
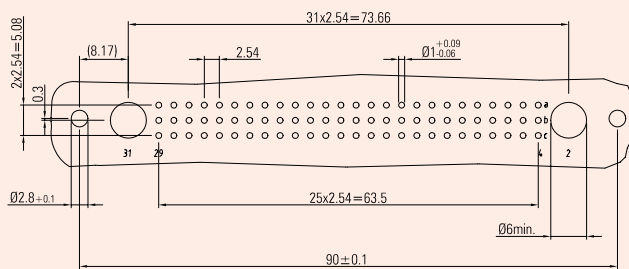


Female Connectors Type M Flat Rock
for Special Contacts acc. DIN 41626



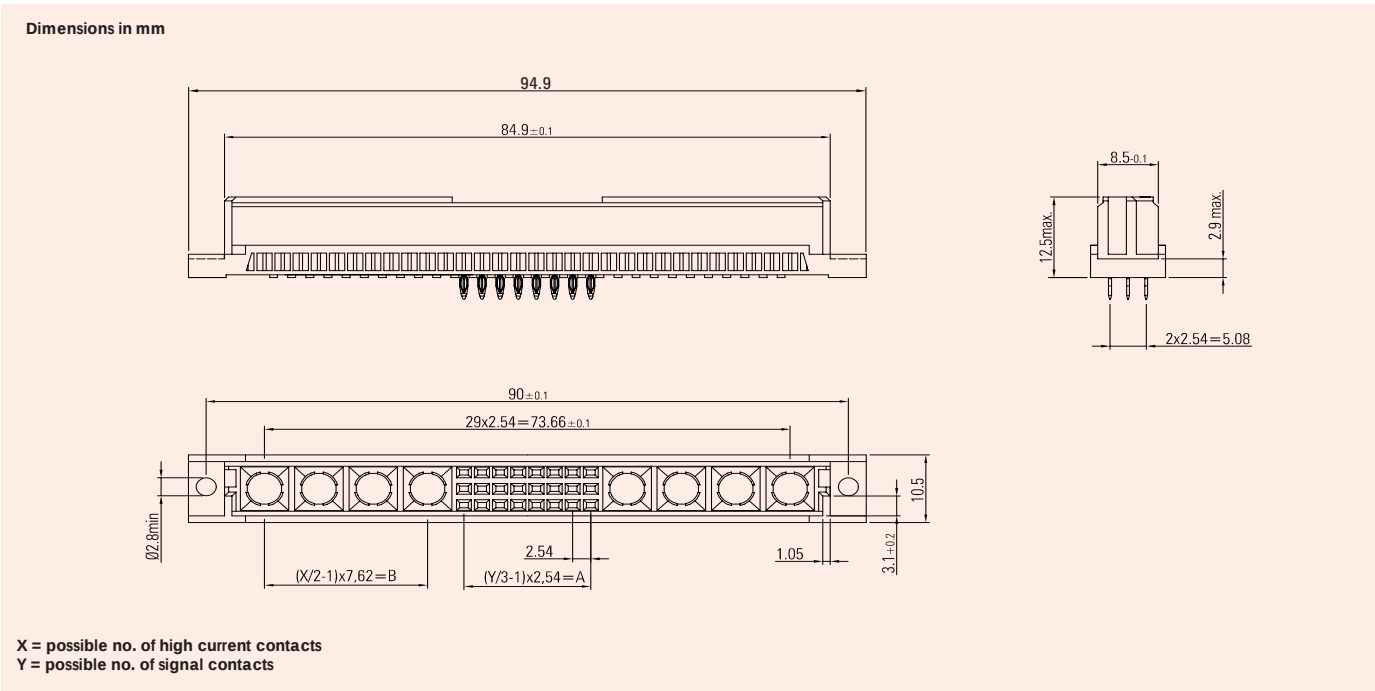
No. of Positions		6/10	24/8	42/6	60/4	78/2
Termination Methods	special contact	Part Numbers				
	acc. DIN 41626	124-60112-00	124-60182-00	124-60162-00	124-60142-00	124-60122-00

Insertion tool: Part No. see page 5.8
Note: Female connectors must be screwed or riveted to the PCB at the flange – special contacts on request

**Printed Circuit Layout
for SnPb-PCB's**




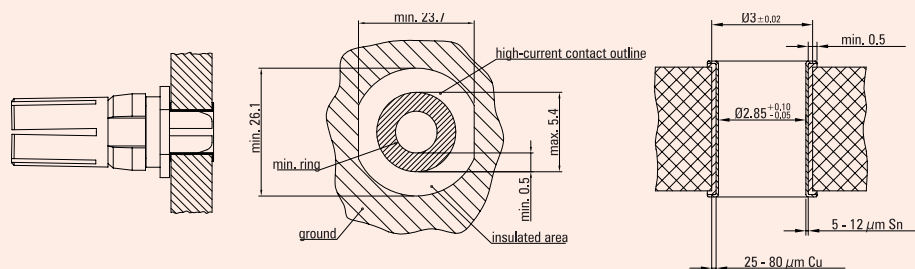
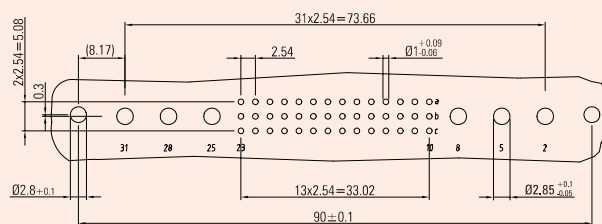
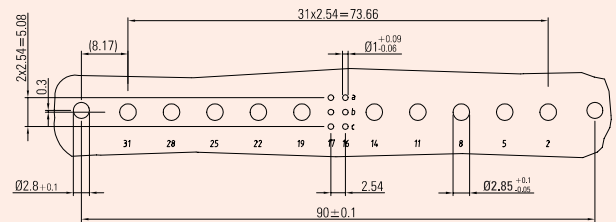
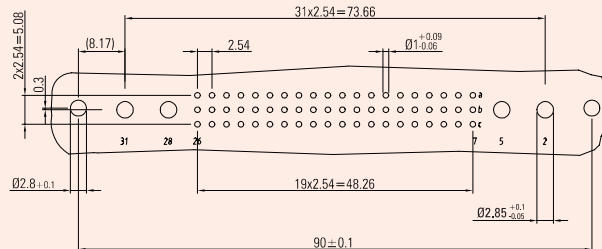
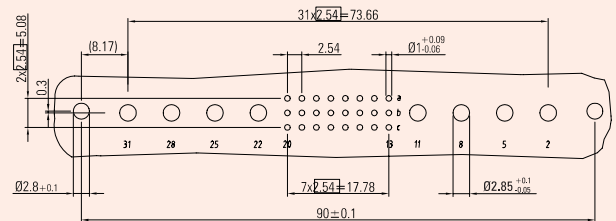
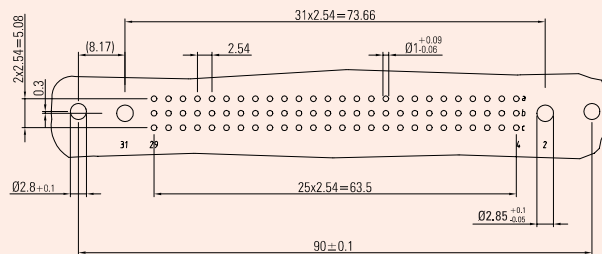
Female Connectors Type M Flat Rock
for Special Contacts in Press-fit Technology



No. of Positions		6/10	24/8	42/6	60/4	78/2
Termination Methods	Special contact	Part Numbers				
	not pre loaded	124-60012-00	124-60082-00	124-60062-00	124-60042-00	124-60022-00
	pre loaded	124-60012-02	124-60082-02	124-60062-02	124-60042-02	124-60022-02

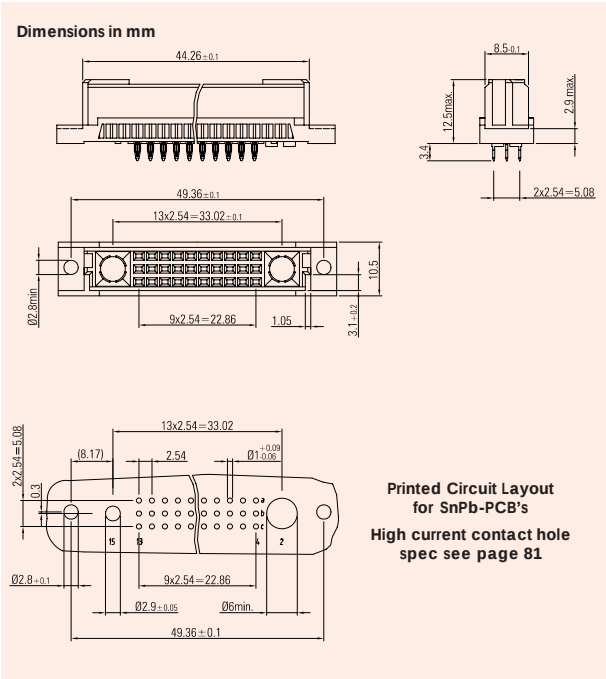
Insertion tool: Part No. see page 5.8
Note: Female connectors must be screwed or riveted to the PCB at the flange – special contacts on request

Printed Circuit Layout for SnPb-PCB's





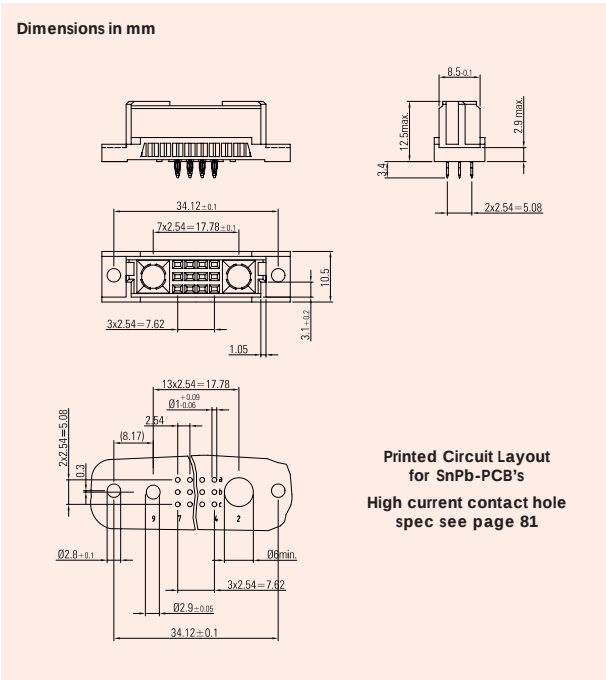
Female Connectors Type M/2 and M/3



Type M/2

No. of Positions		30 / 2
Termination Methods	Special contacts	Part Numbers
	acc. DIN 41626	124-69122-00
	Press-fit not pre loaded	124-69022-00
	Press-fit pre loaded	124-69022-02

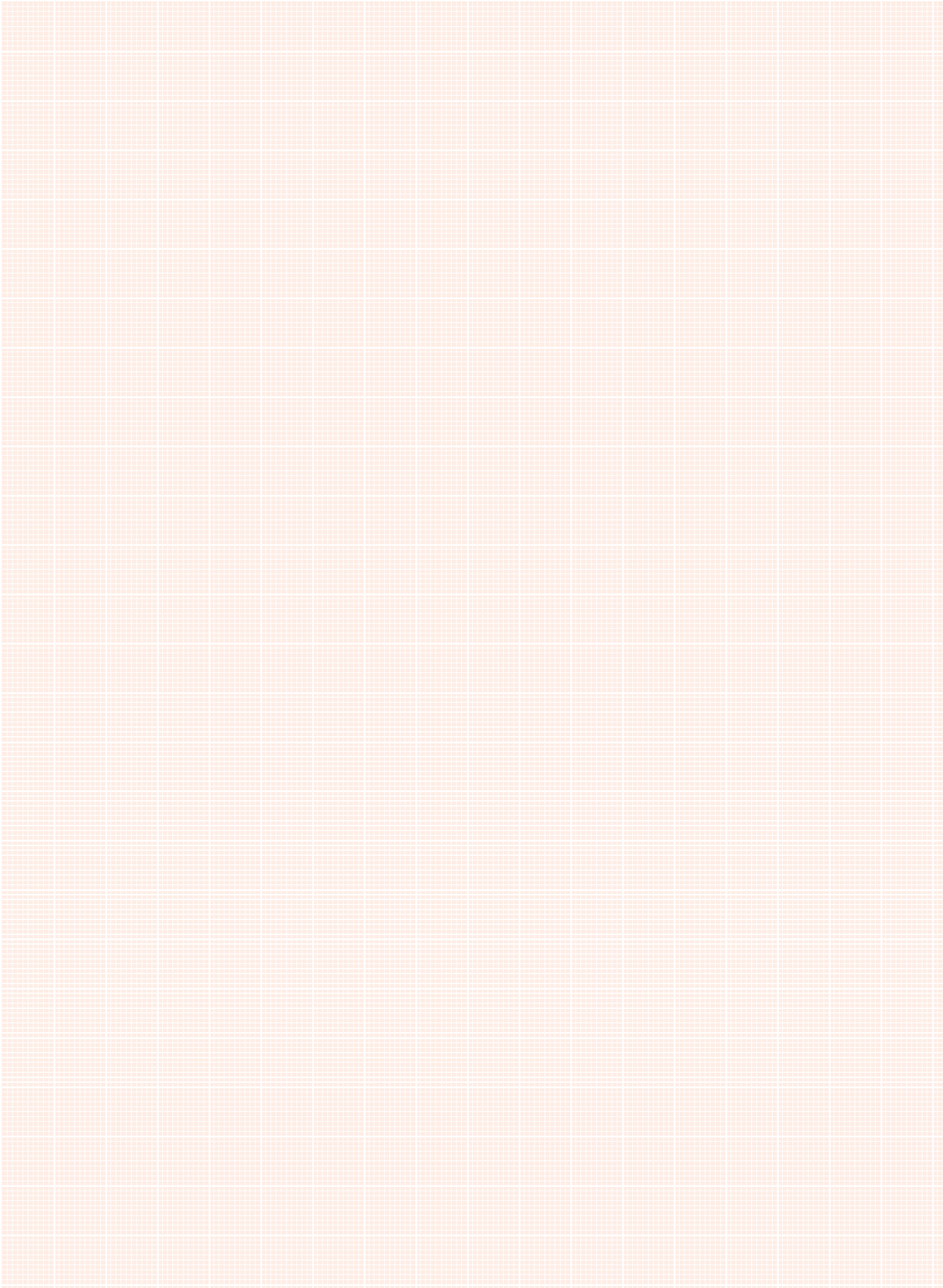
Insertion tool: Part No. 884-541
Note: Female connectors must be screwed or riveted to the PCB at the flange – High current contacts see page 3.21.



Type M/3

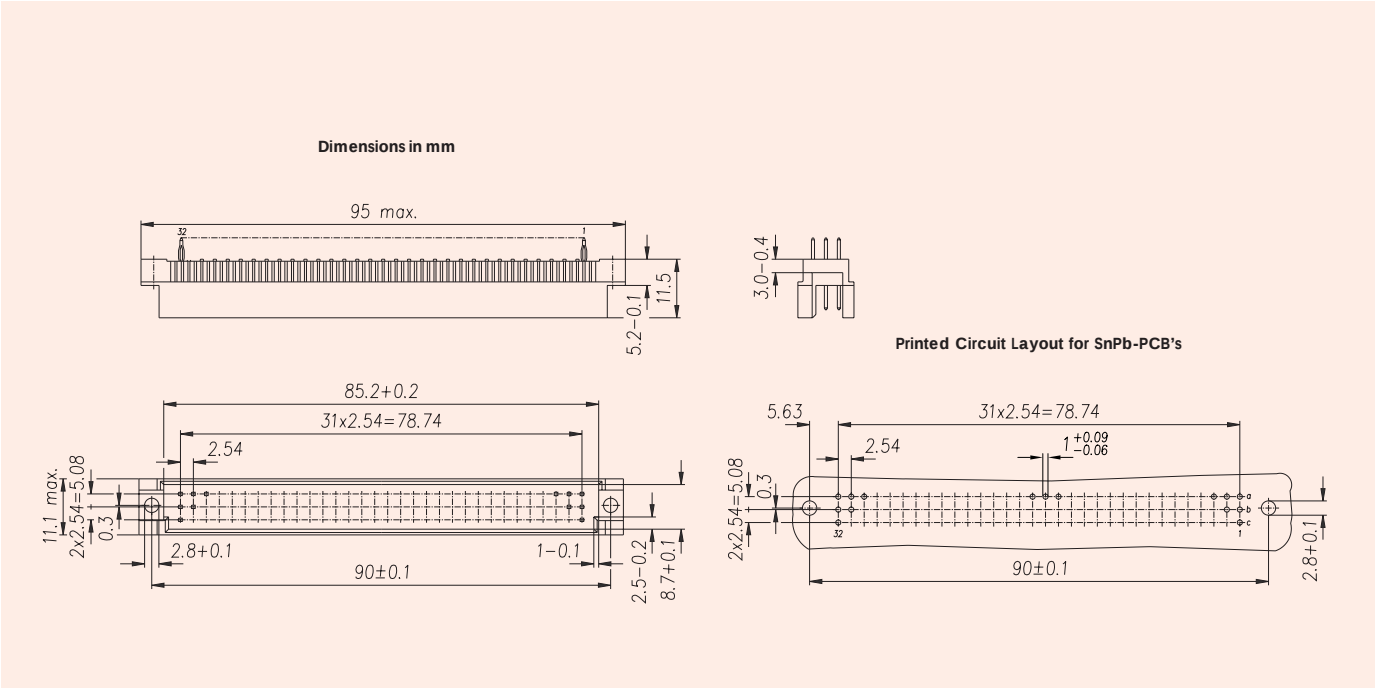
No. of Positions		12 / 2
Termination Methods	Special contacts	Part Numbers
	acc. DIN 41626	124-68122-00
	Press-fit not pre loaded	124-68022-00
	Press-fit pre loaded	124-68022-02

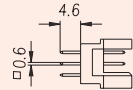
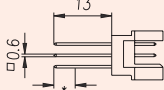
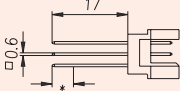
Insertion tool: Part No. 884-542
Note: Female connectors must be screwed or riveted to the PCB at the flange – High current contacts see page 3.21.





Male Connectors Type R



No. of Positions		32	48	64	96
Position		Row a,c (2,4,6,...)	Row a,b,c (2,4,6,...)	Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers			
	II	115-60014	115-60044	115-60054	115-60064
	II	115-65015	115-65045	115-65055	115-65065
	II	115-65016	115-65046	115-65056	115-65066

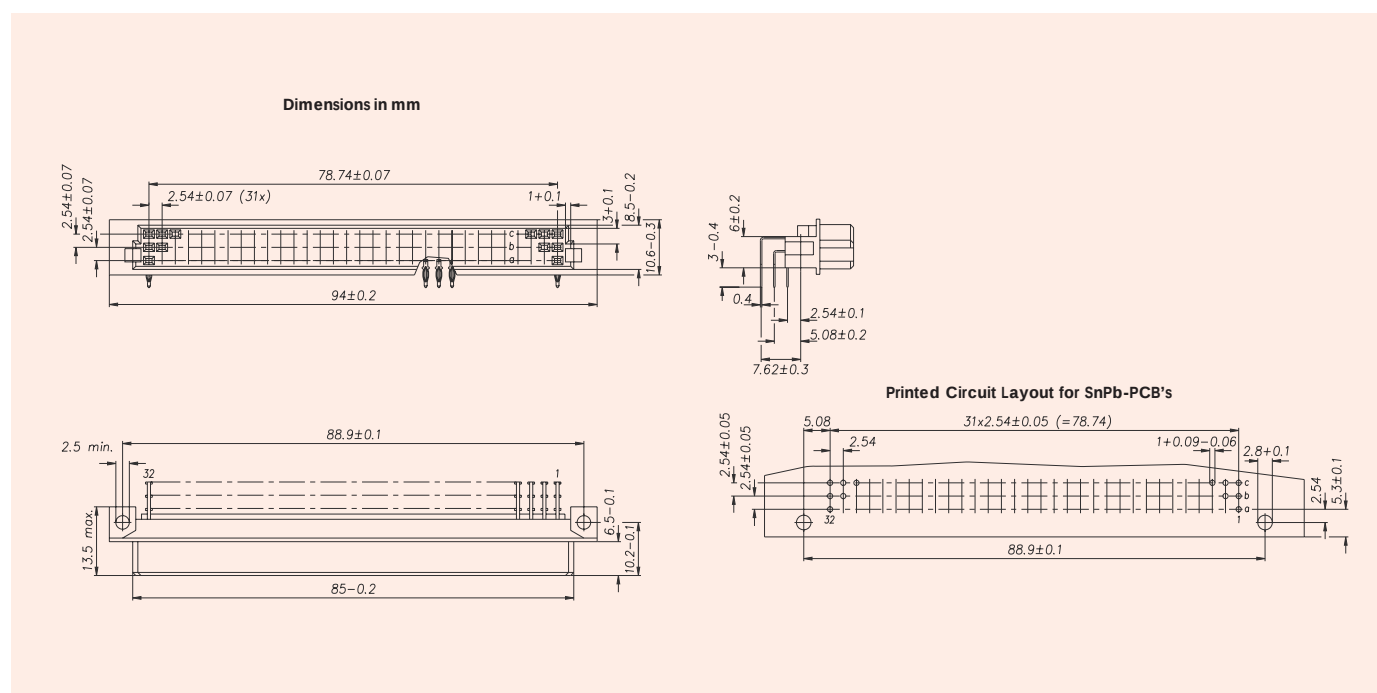
* Contact area Au/Ni / Terminals SnPb Part No. 115-60...

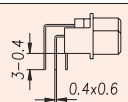
On request: First mate last break contacts — Special assembly possible — other quality class possible

Insertion tool: Part No. 884-525



Female Connectors Type R



No. of Positions		64	96
Position		Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers	
	II	116-60054	116-60074

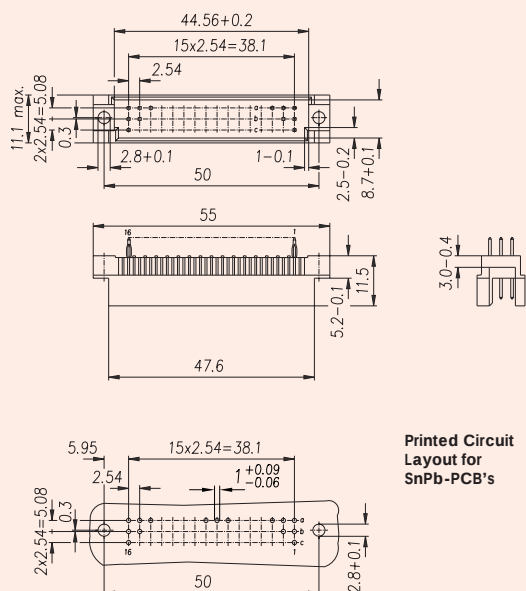
Insertion tool: Part No. **884-500**

Additional Parts	Part Number
Keying Comb	116-15109

Type R/2

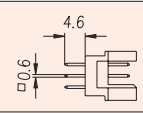
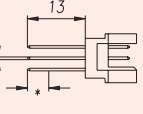
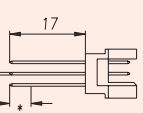


Dimensions in mm



Printed Circuit
Layout for
SnPb-PCB's

Male Connectors

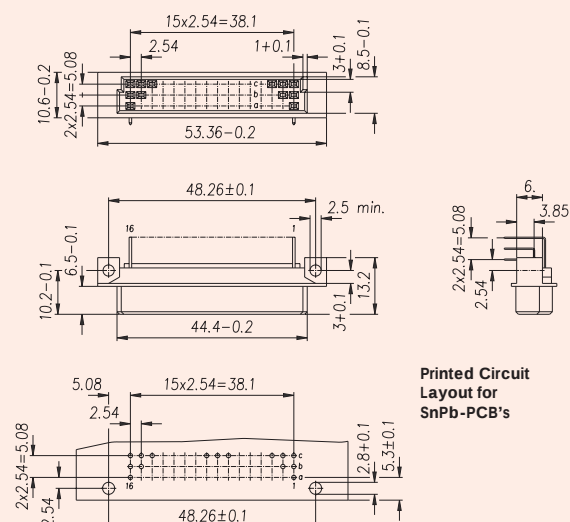
No. of Positions		32	48
Position		Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers	
	II	115-69054	115-69064
	II II*	115-69055 115-79055	115-69065 115-79065
	II II*	115-69056 115-79056	115-69066 115-79066

* Terminals Au/Ni

On request: First mate late break contacts — Special assembly possible — other quality class possible

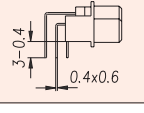
Insertion tool: Part no. **884-526**

Dimensions in mm



Printed Circuit
Layout for
SnPb-PCB's

Female Connectors

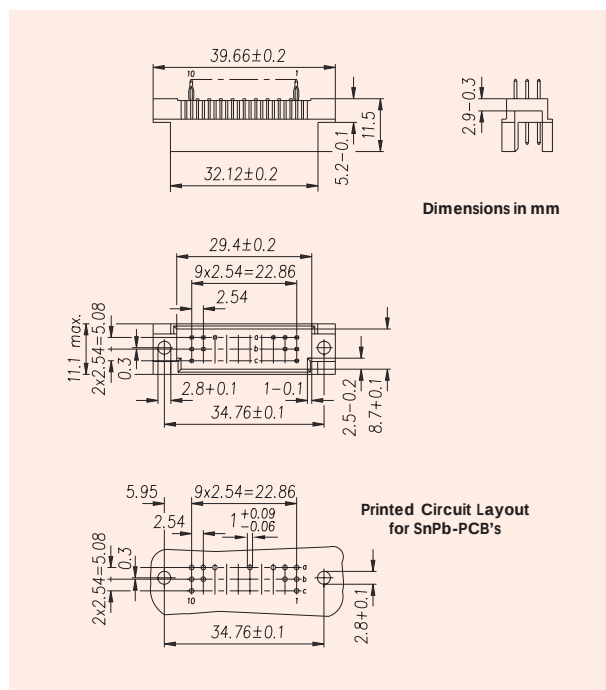
No. of Positions		32	48
Position		Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers	
	II	116-69054	116-69064

On request: with/without mounting flange — Special assembly possible — other quality class possible

Insertion tool: Part No. **884-501**



Type R/3

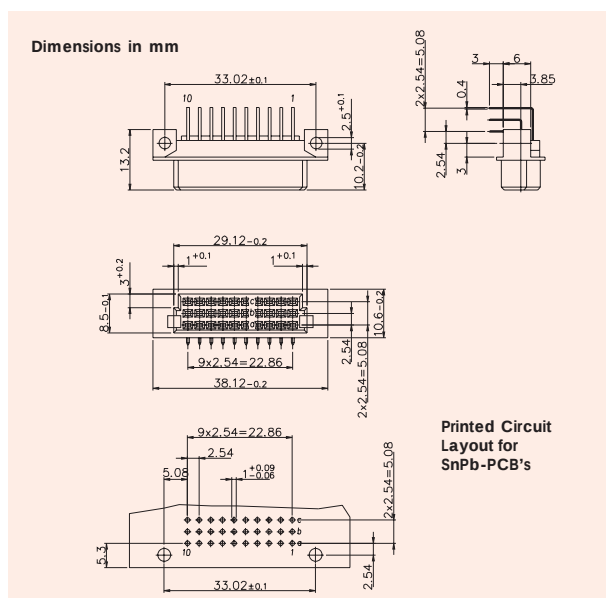


Male Connectors

No. of Positions		30
Position		Row a,b,c
Termination Methods	Quality Class	Part Numbers
	II	115-68014
	II	115-78015
	II	115-78016

On request: First mate last break contacts — Special assembly possible — other quality class possible

Insertion tool: Part No. **884-527**



Female Connectors

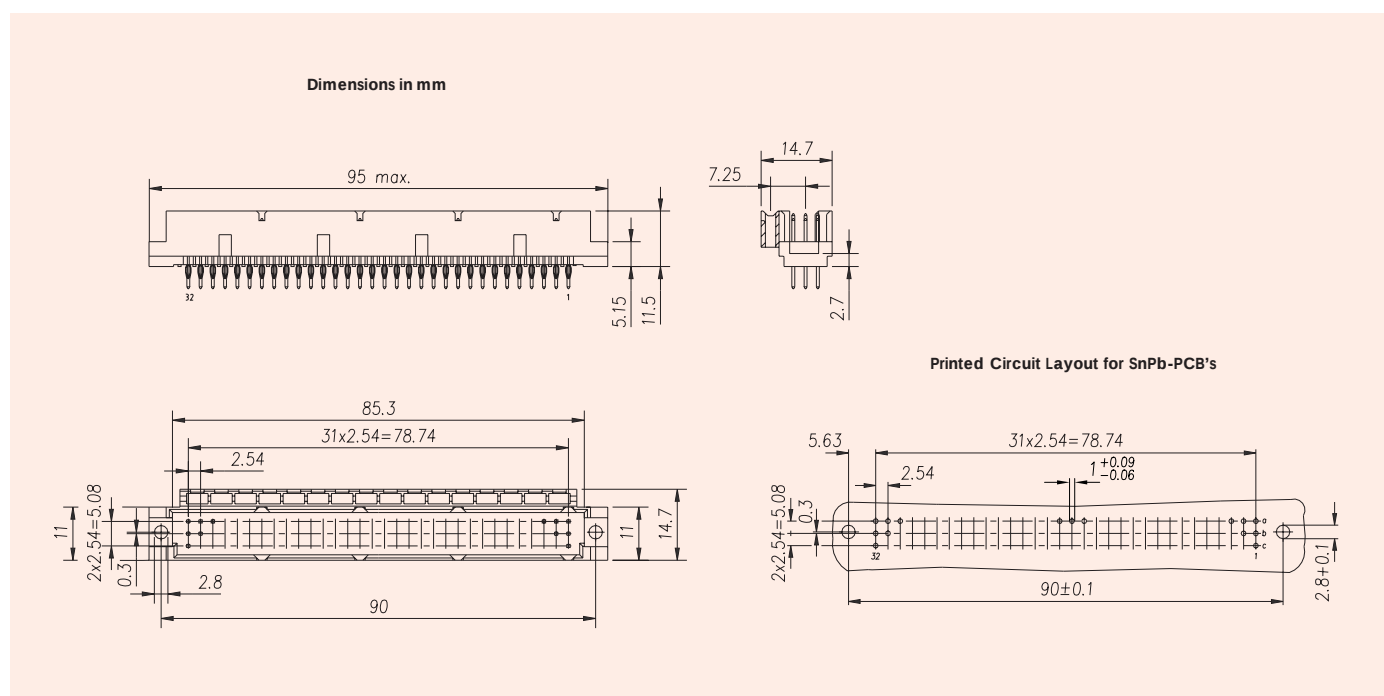
No. of Positions		30
Position		Row a,b,c
Termination Methods	Quality Class	Part Numbers
	II	116-68064

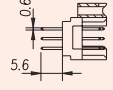
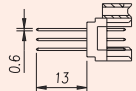
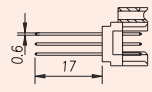
On request: with/without mounting flange — Special assembly possible — other quality class possible

Insertion tool: Part No. **884-501**



Male Connectors Type R with Keying

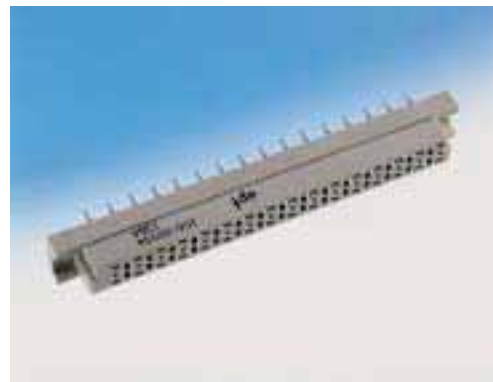


No. of Positions		64	96
Position		Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers	
	II	115-61054	115-61064
 *	II	115-66055	115-66065
 *	II	115-66056	115-66066

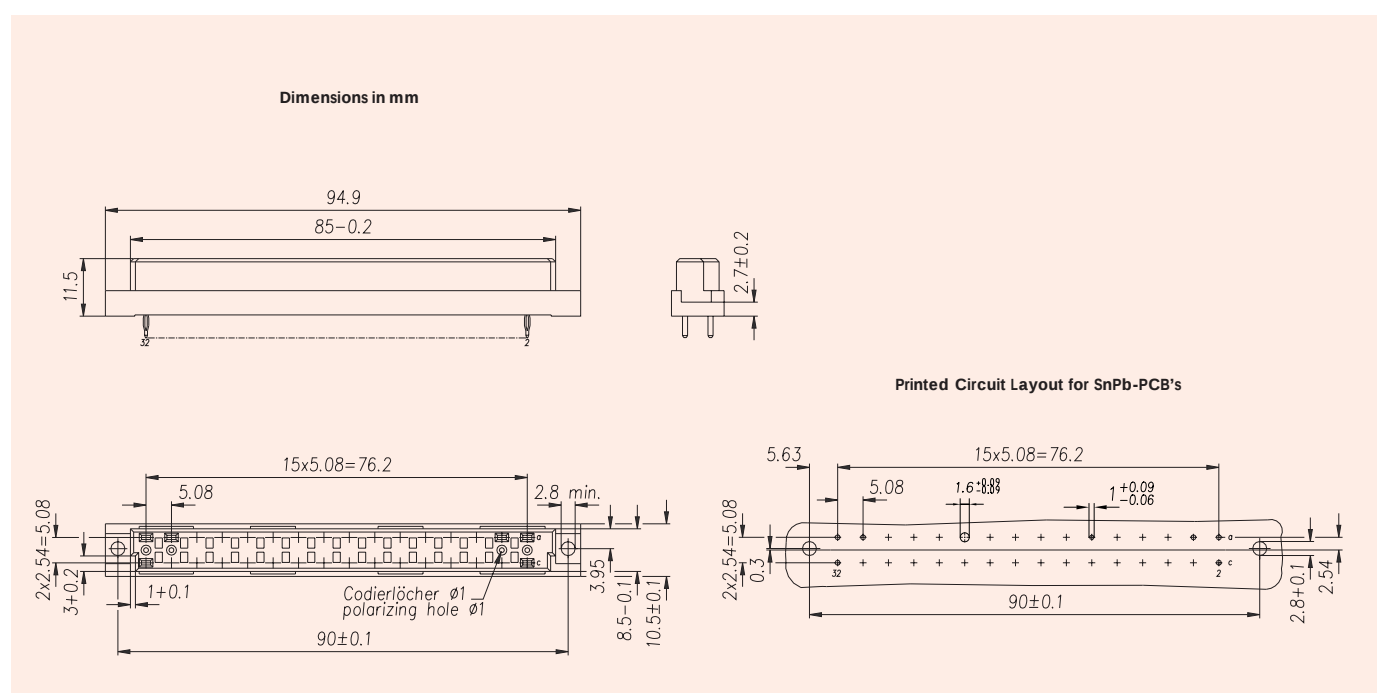
* Contact area Au/Ni / Terminals SnPb Part No. 115-61...

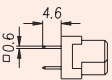
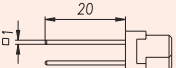
On request: First mate last break contacts — Special assembly possible — Keying Comb — other quality class possible

Insertion tool: Part No. 884-524



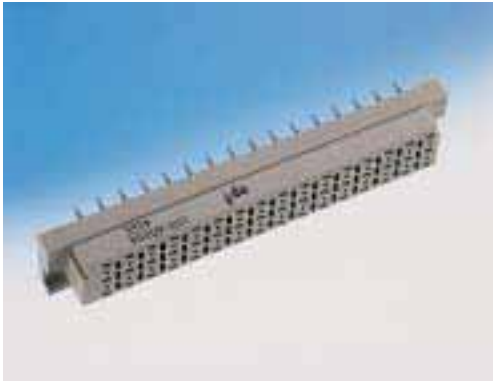
Female Connectors Type D



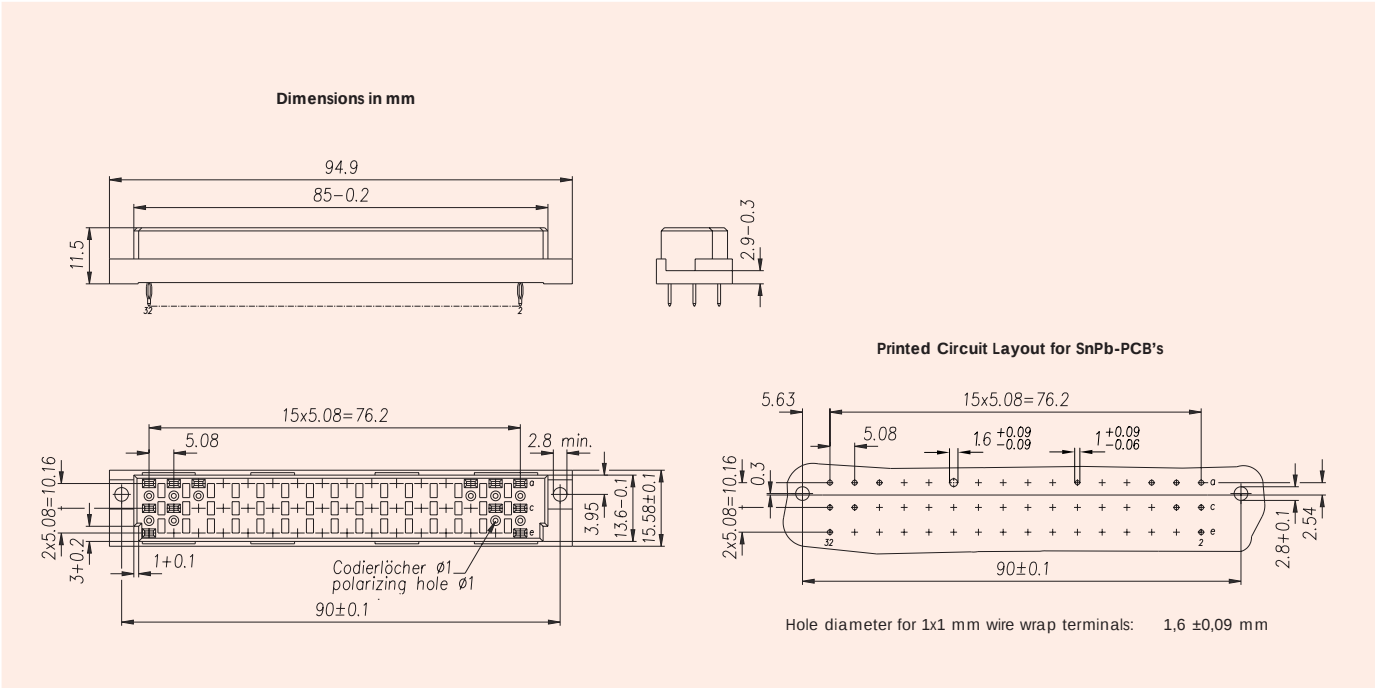
No. of Positions		16	32
Position		Row a,c (2,6,10,...)	Row a,c
Termination Methods	Quality Class	Part Numbers	
	II	106-60034	106-60084
	II	106-60015	106-60065

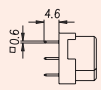
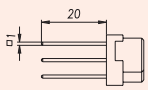
On request: Keying pins (see page 1.17) — other quality class possible

Insertion tool: Part No. **884-303**

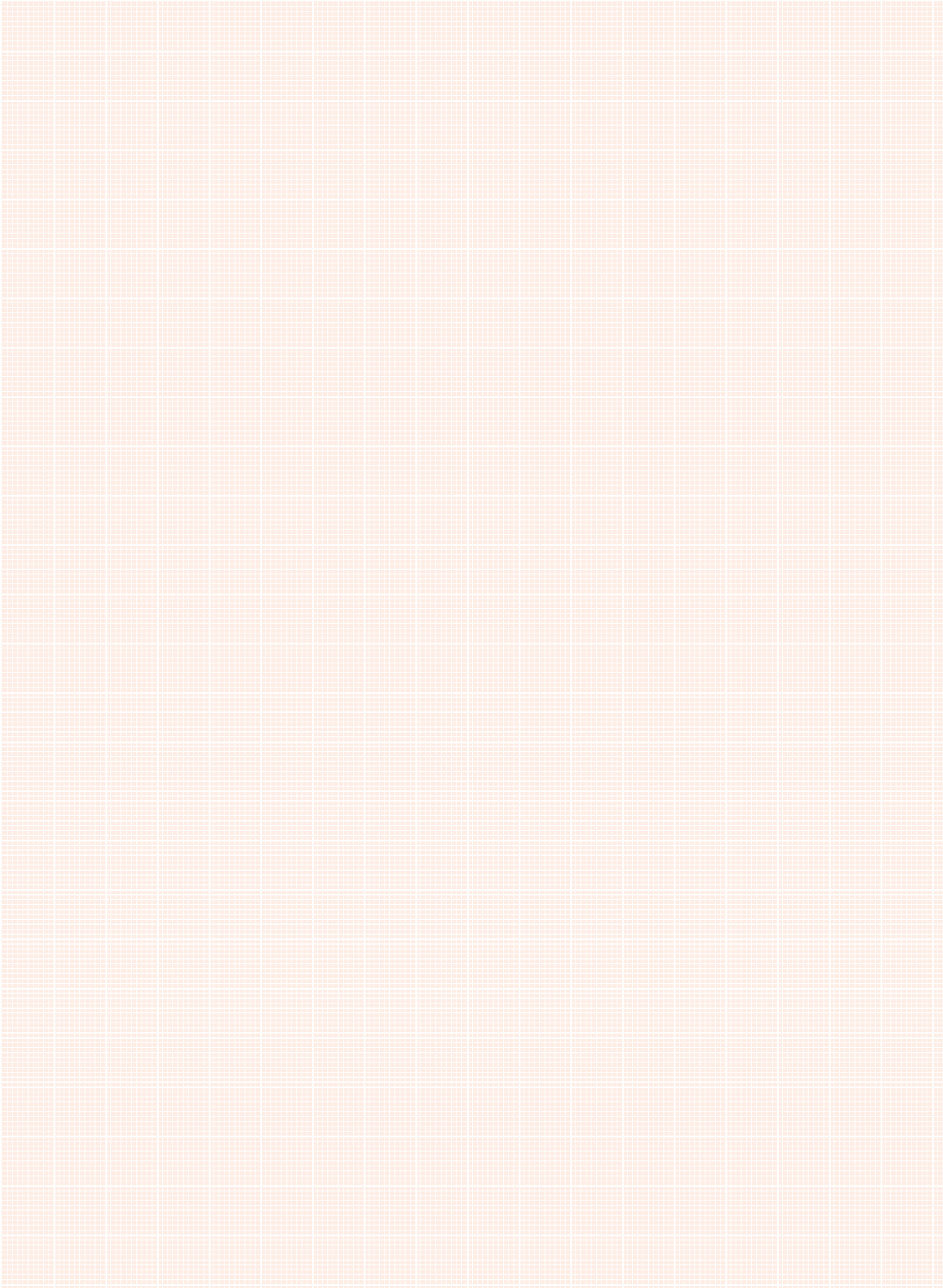


Female Connectors Type E



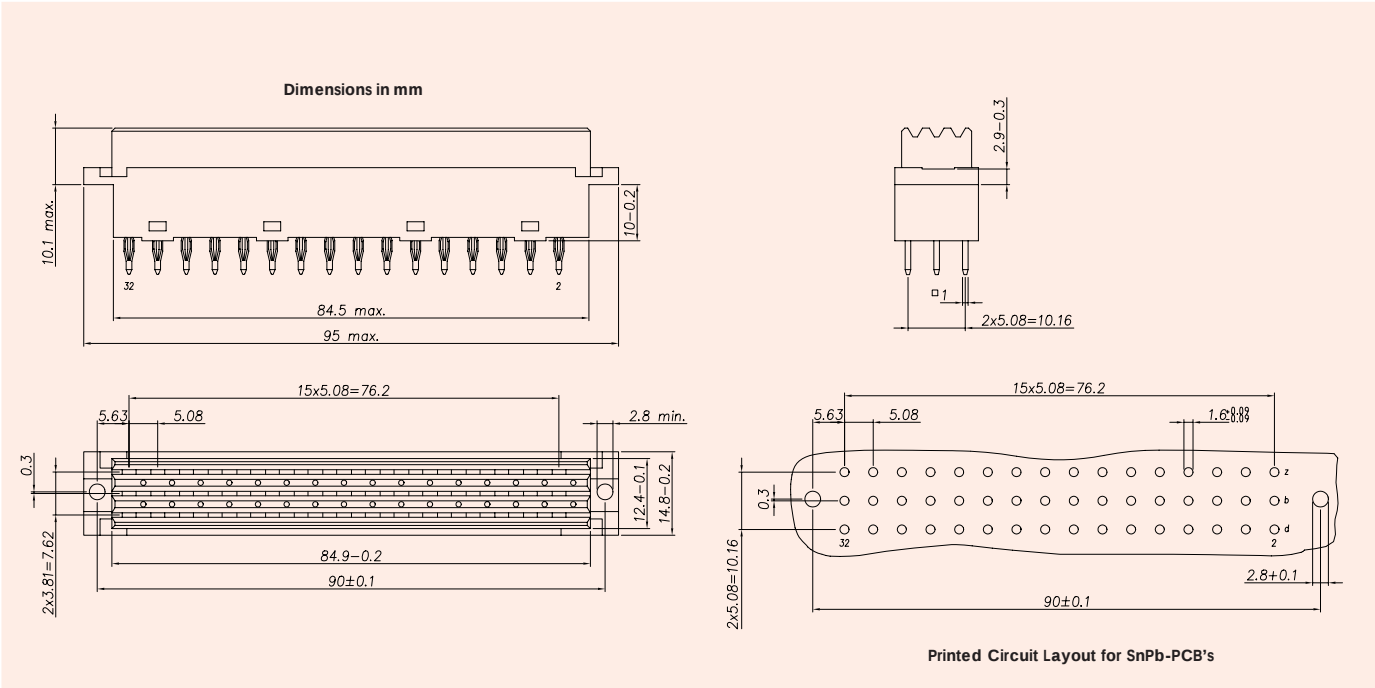
No. of Positions		32	32	48
Position		Row a, c	Row a, e	Row a, c, e
Termination Method	Quality Class	Part Numbers		
	II	108-60054	108-60044	108-60084
	II	108-60015	108-60025	108-60065

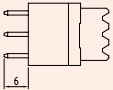
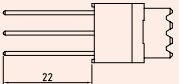
On request: Pin lenght to customer request — Keying pins (see page 1.17) — other quality class possible
Insertion tool: Part No. 884-353





Female Connectors Type F

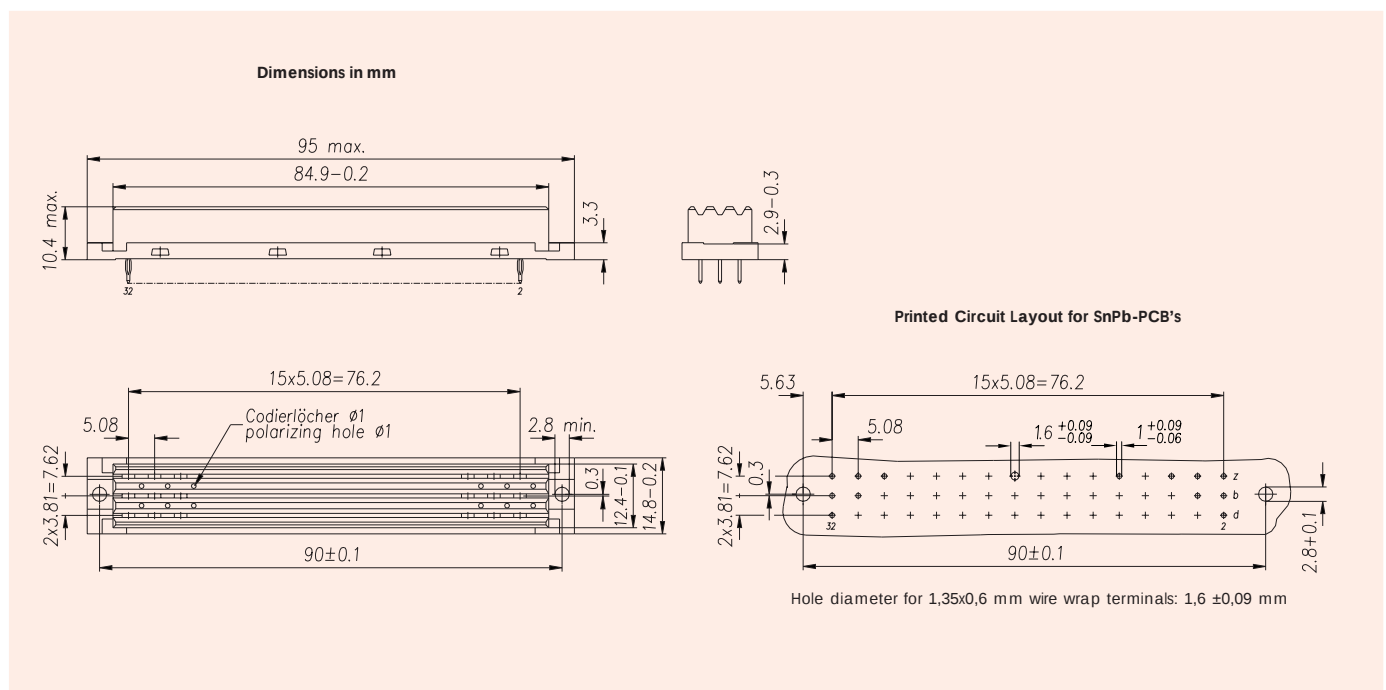


No. of Positions		32	32	48
Position		Row b, z	Row d, z	Row d, b, z
Termination Method	Quality Class	Part Numbers		
	II	110-60025	110-60015	110-60065
	II	110-60024	110-60014	110-60064

On request: Keying pins (see page 1.17) — other quality class possible
Insertion tool: Part No. **884-401**



Female Connectors Type F low profile



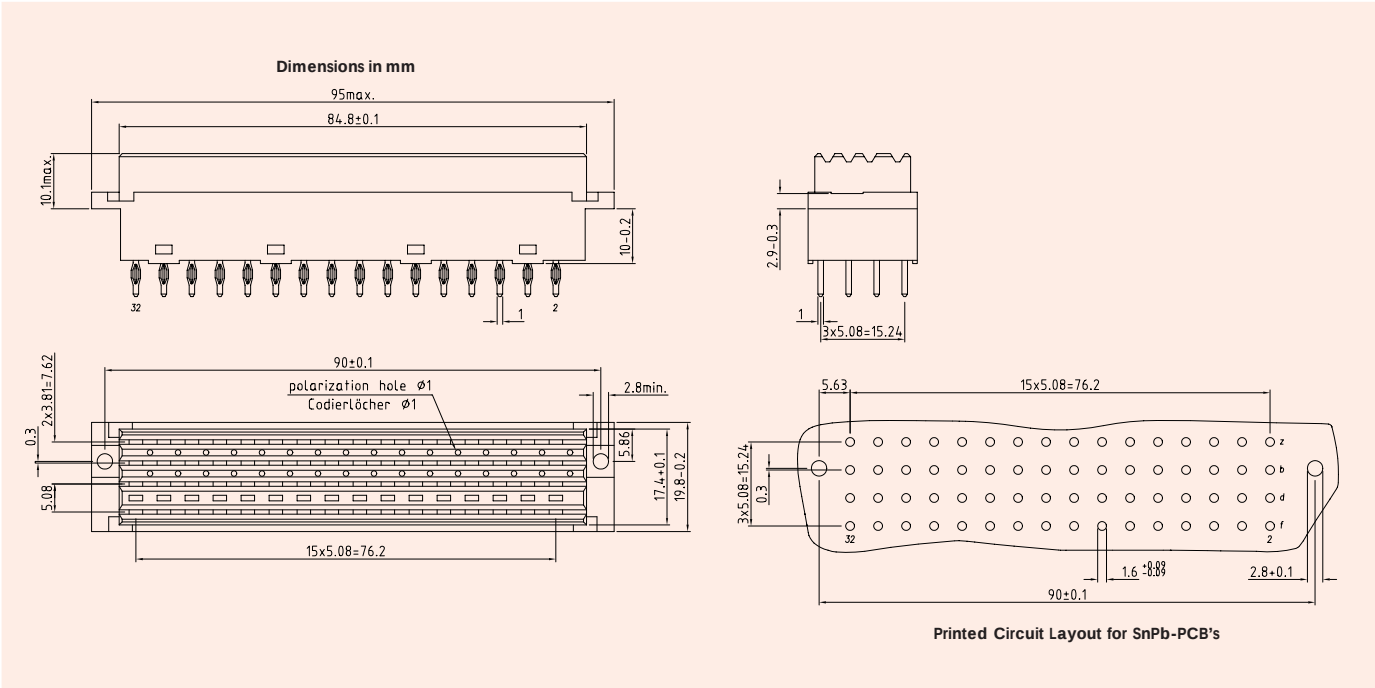
No. of Positions		32	32	48
Position		Row b, z	Row d, z	Row d, b, z
Termination Method	Quality Class	Part Numbers		
	II	110-61005	110-61004	110-61084
	II	110-66025	110-66015	110-66065

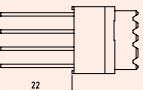
* Terminals Au/Ni

On request: with/without mounting flange — Keying pins (see page 1.17) — other quality class possible
Insertion tool: Part No. 884-406



Female Connectors Type G

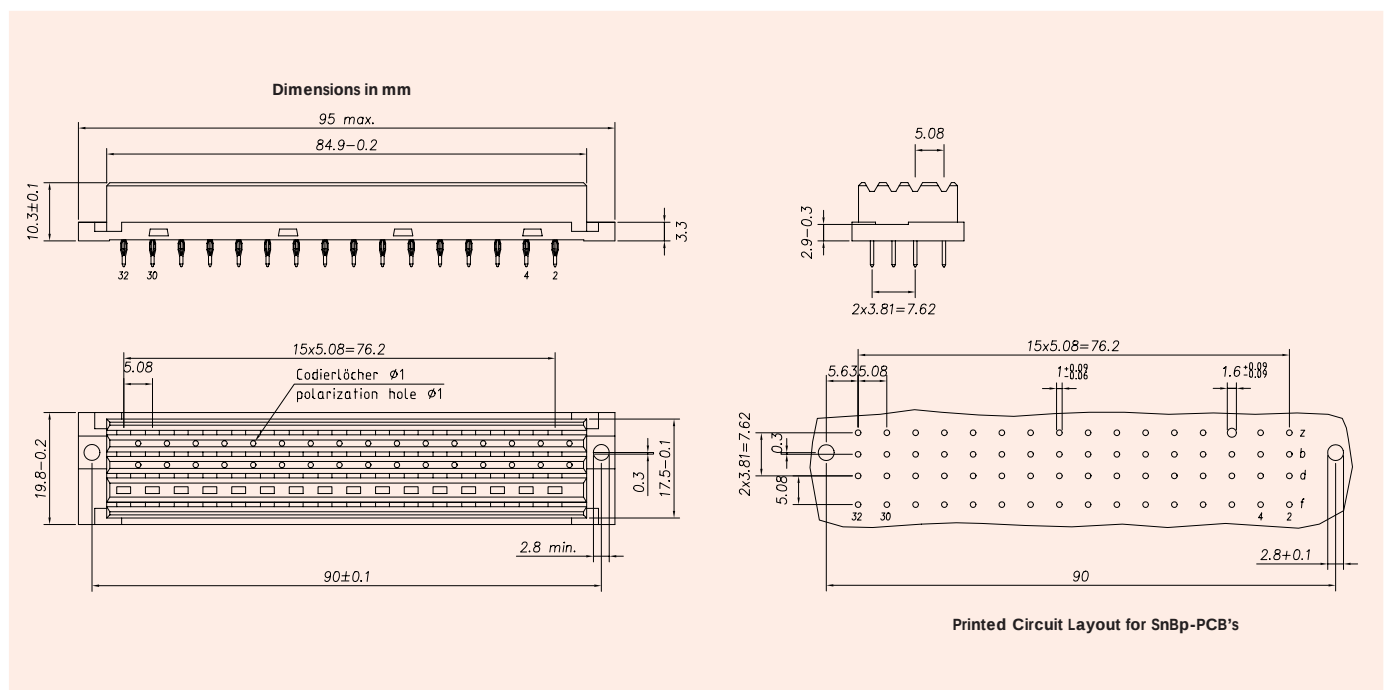


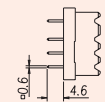
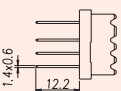
No. of Positions		64
Positions		Row z, b, d, f
Termination Methods	Quality Class	Part Numbers
	II	112-60064
	II	112-60065

On request: Keying pins (see page 1.17) — other quality class possible
Insertion tool: Part Number 884-453



Female Connectors Type G low profile

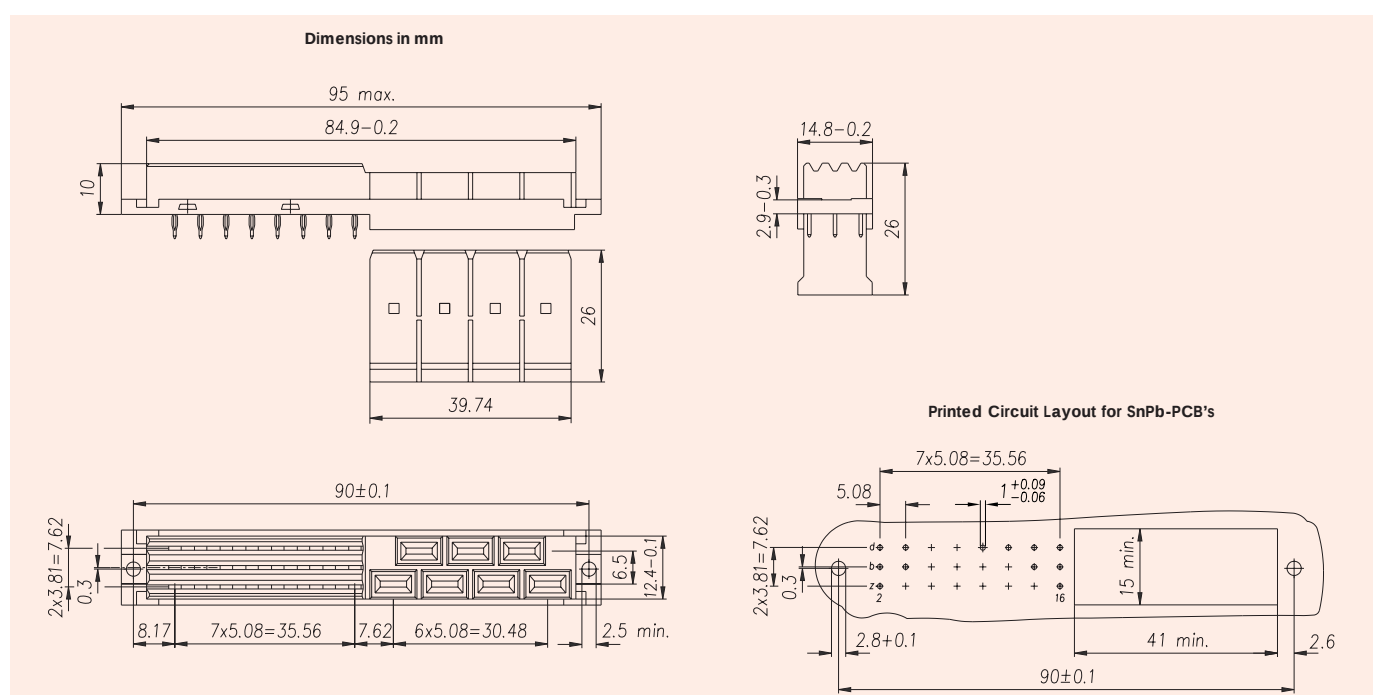


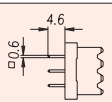
No. of Positions		64
Position		Row z, b, d, f
Termination Methods	Quality Class	Part Numbers
	II	112-61084
	II	112-66065

On request: with/without mounting flange – Keying pins (see page 1.17) — other quality class possible
Insertion tool: Part Number **884-451**



Female Connectors Type H7/F24 mixed pin low profile

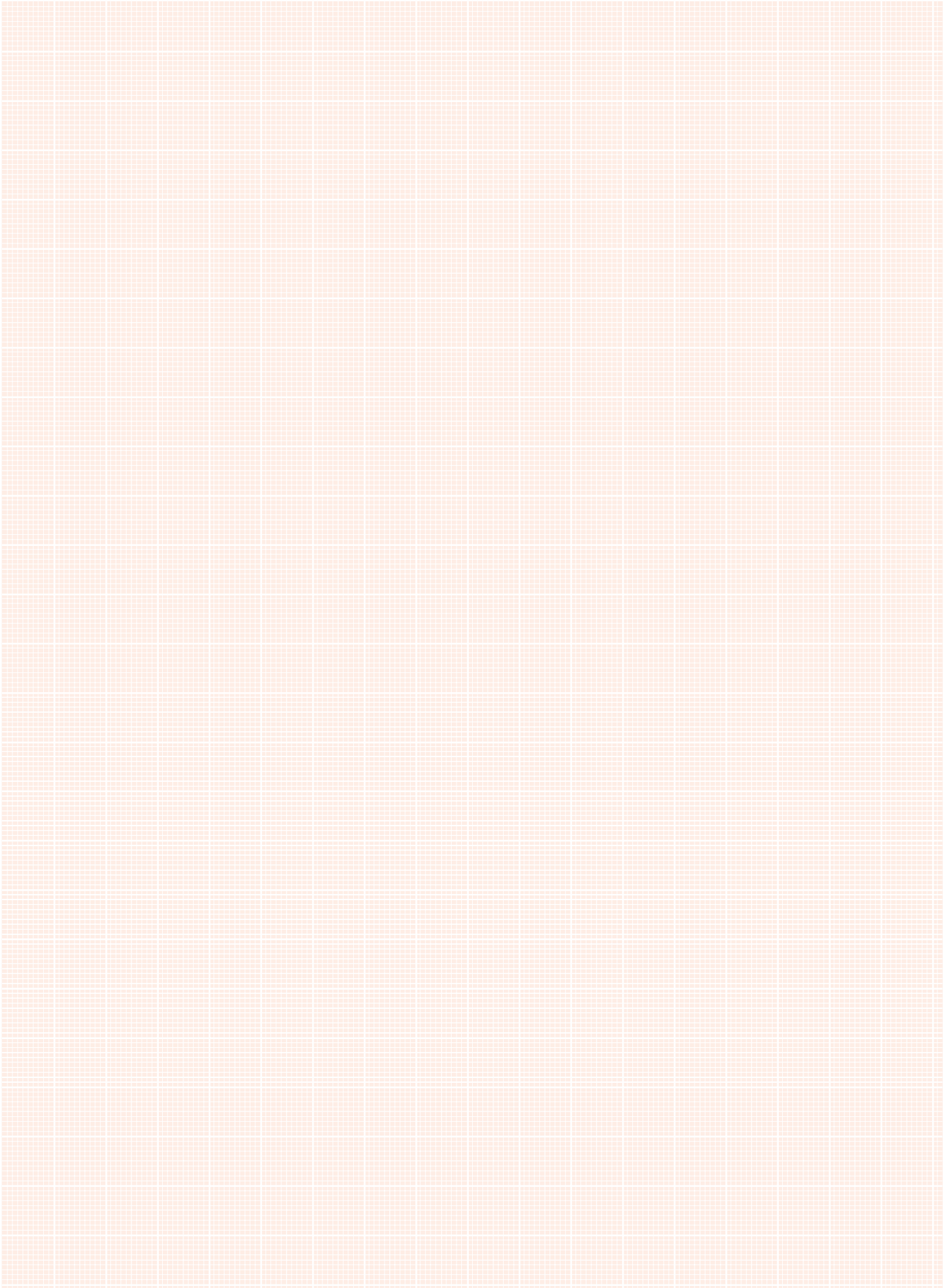


No. of Positions		7+16	7+16	7+24
Position		Row b, z	Row d, z	Row d, b, z
Termination Method	Quality Class	Part Numbers		
	II	118-60016	118-60006	118-60084

On Request: other quality class possible
Insertion tool: Part No. 884-555

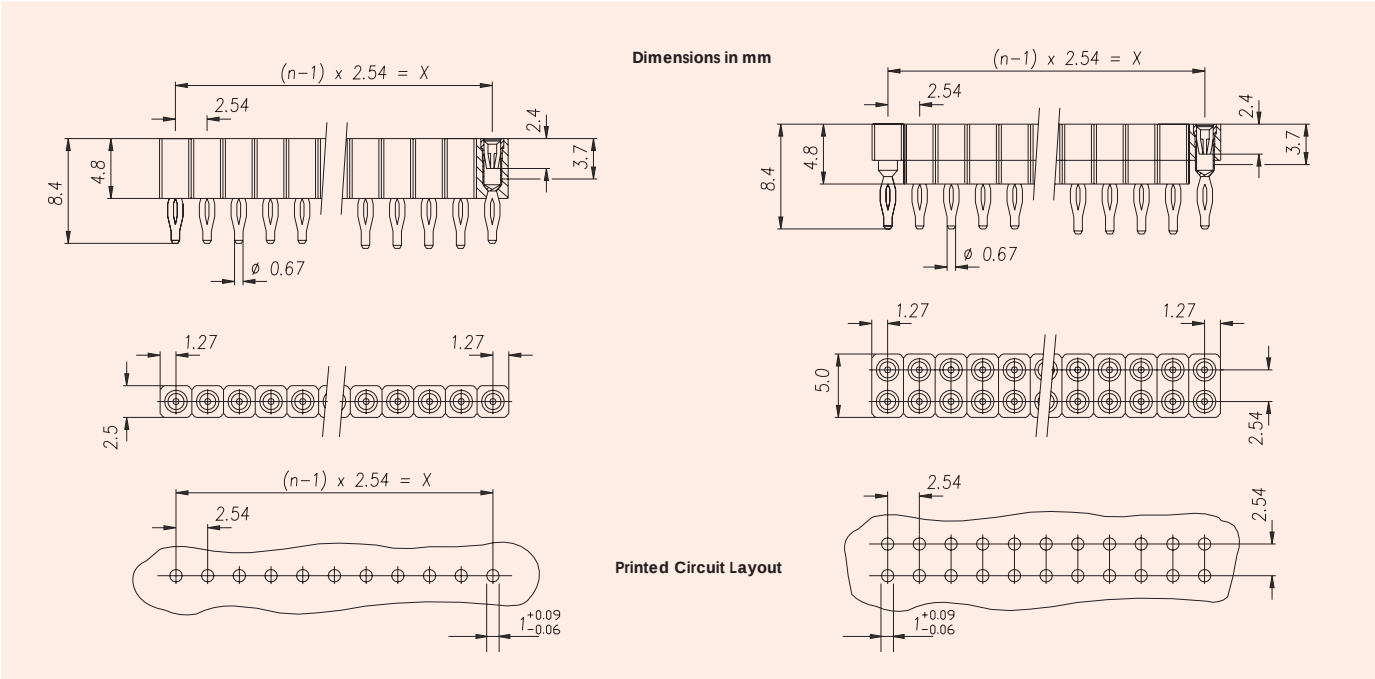
Crimp-contacts for H7 power terminal

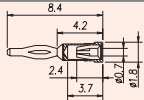
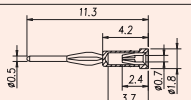
Cross section (mm ²)	Packing Unit	Part Numbers
1,5 - 2,5	250	118-21062
0,5 - 1,0	250	118-21063
2,5 - 4,0	250	118-21064





Socket Strips



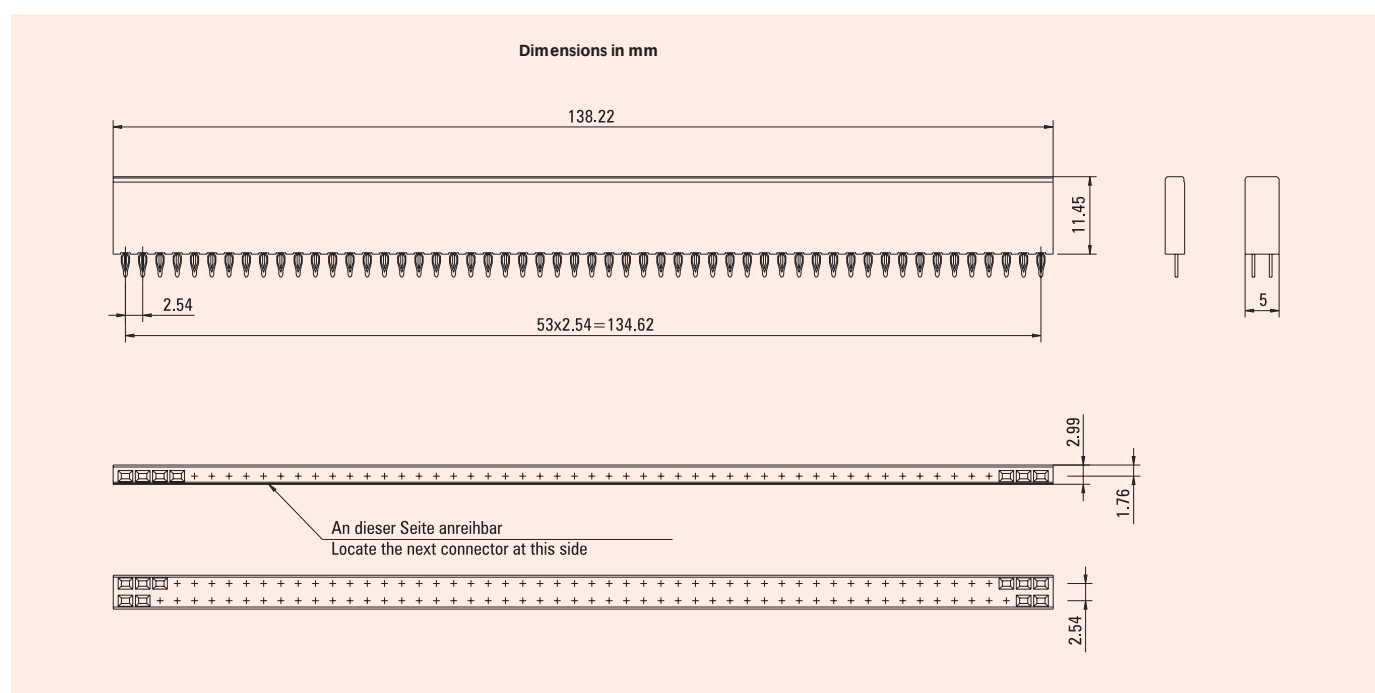
		one-row max. 32 pins	two-row max. 64 pins
Termination Methods	Contact Surface	Part Numbers	
	5 µm SnPb	930-61xx0	936-61xx0
	0,25 µm Au	930-61xx4	936-61xx4
	5 µm SnPb	—	—
	0,25 µm Au	930-66xx4	936-66xx4

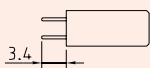
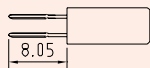
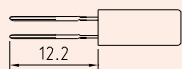
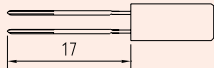
* Terminal Au/Ni
xx = No. of positions per row
Ordering sample: 2x20 pins / 0,25 µm Au / two row / 8,4 mm – Part Number: **936-61204**
Insertion Tools: 1-row Part No. **on request**
2-row Part No. **on request**



VarPol Female Connectors

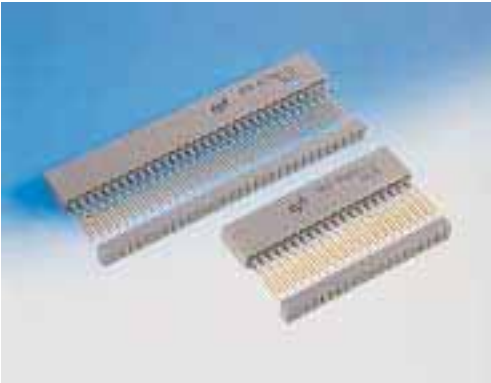
flat rock technology



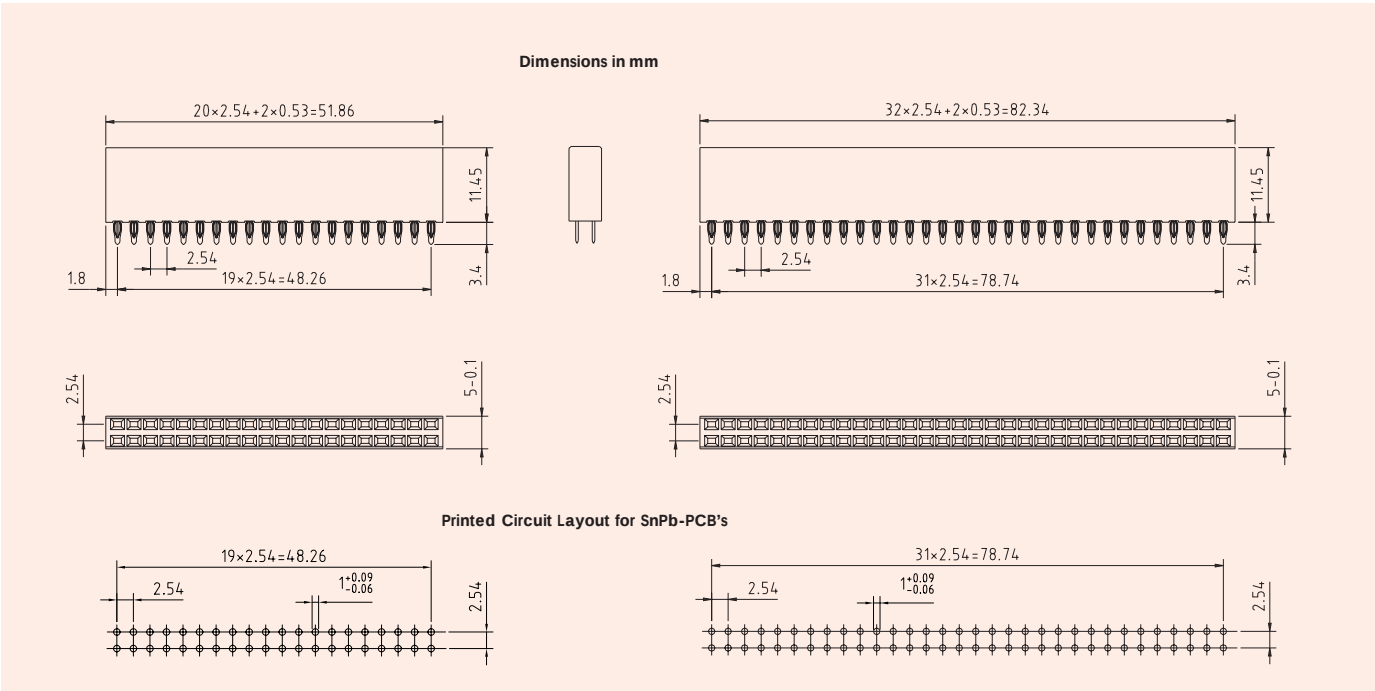
No. of Positions		54	108
Position		1-row	2-row
Termination Methods	Quality Class	Part Numbers	
	I	—	—
	II	961-60nn6-03	962-60nn6-03
	III	961-60nn2-03	962-60nn2-03
	I	—	—
	II	961-61nn6-07	962-61nn6-07
	III	961-61nn2-07	962-61nn2-07
	I	—	—
	II	961-60nn6-12	962-60nn6-12
	III	961-60nn2-12	962-60nn2-12
	I	—	—
	II	961-60nn6-17	962-60nn6-17
	III	961-60nn2-17	962-60nn2-17

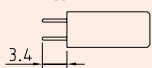
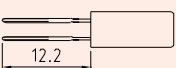
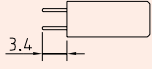
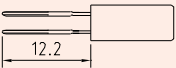
On request: Solder female connector — Insertion tool — Coding pins
nn = no. of positions per row (01 - 54)

Ordering example: 2-rows, 100 pins **962-60506-03**



VarPol PC/104 Female Connectors
flat rock technology

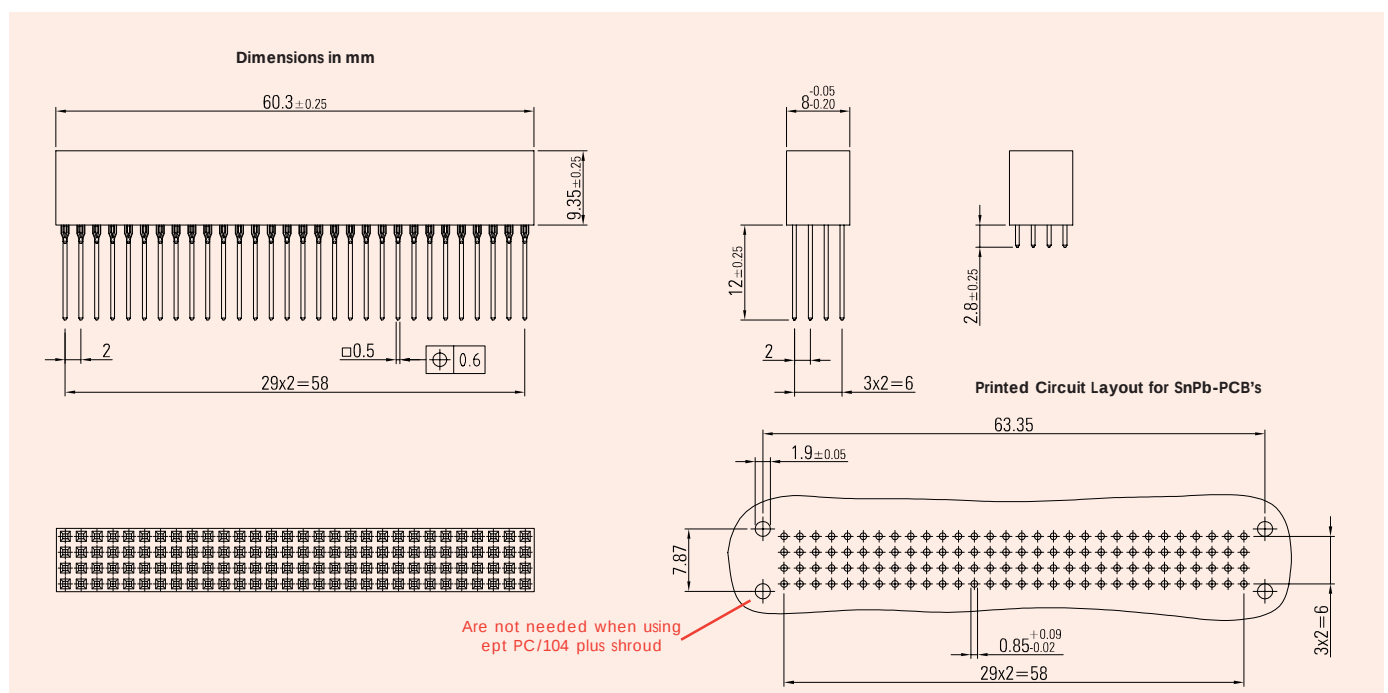


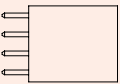
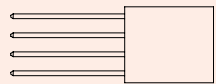
No. of Positions		40	64
Termination Methods	Quality Class	Part Numbers	
	I	—	—
	II	962-60206-03	962-60326-03
	III	962-60202-03	962-60322-03
	I	—	—
	II	962-60206-12	962-60326-12
	III	962-60202-12	962-60322-12
	I	—	—
	II	962-40206-03	962-40326-03
	III	962-40202-03	962-40322-03
	I	—	—
	II	962-40206-12	962-40326-12
	III	962-40202-12	962-40322-12

On request: other numbers of positions
Insertion Tool: Part No. 886-900



PC/104 Plus Female Connectors flat rock technology

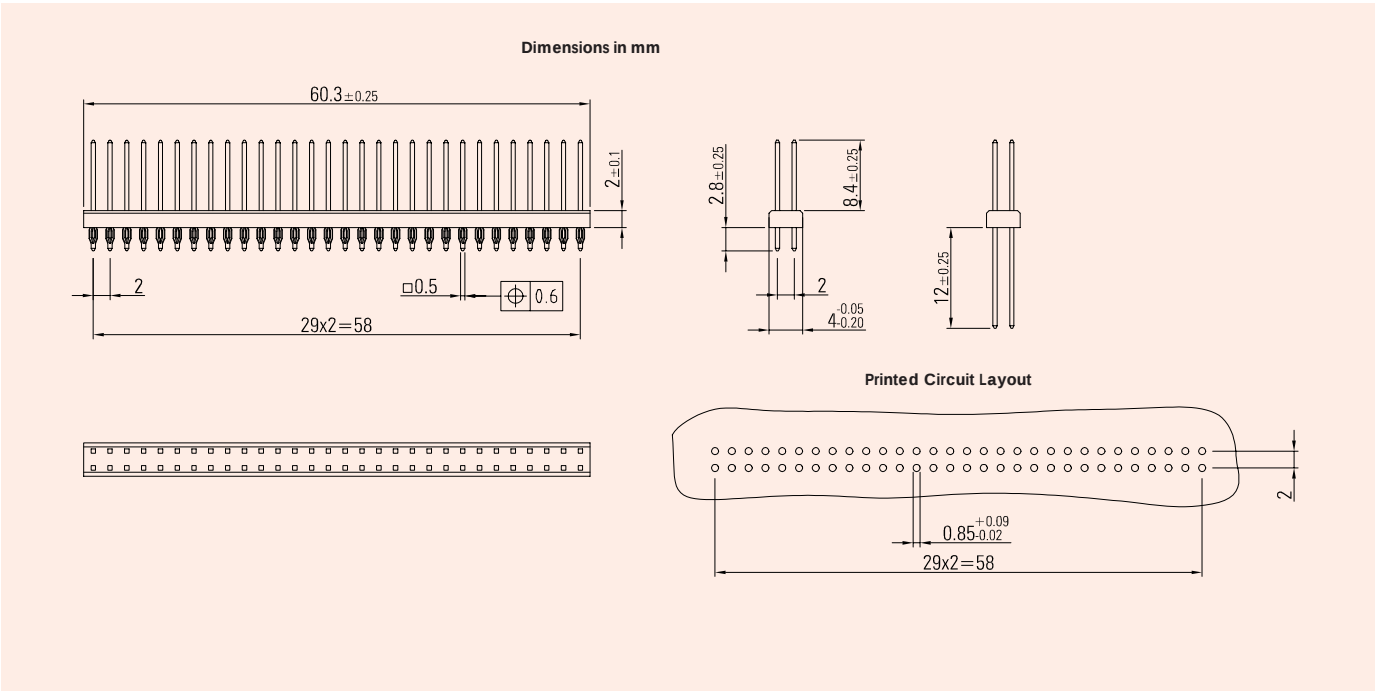


No. of Positions		120
Termination Methods	Quality Class	Part Numbers
	III	264-60303-02
	III	264-60303-12

On request: other no. of positions
 Insertion tool: Part Number **886-900-W3** and **890-602-W1**



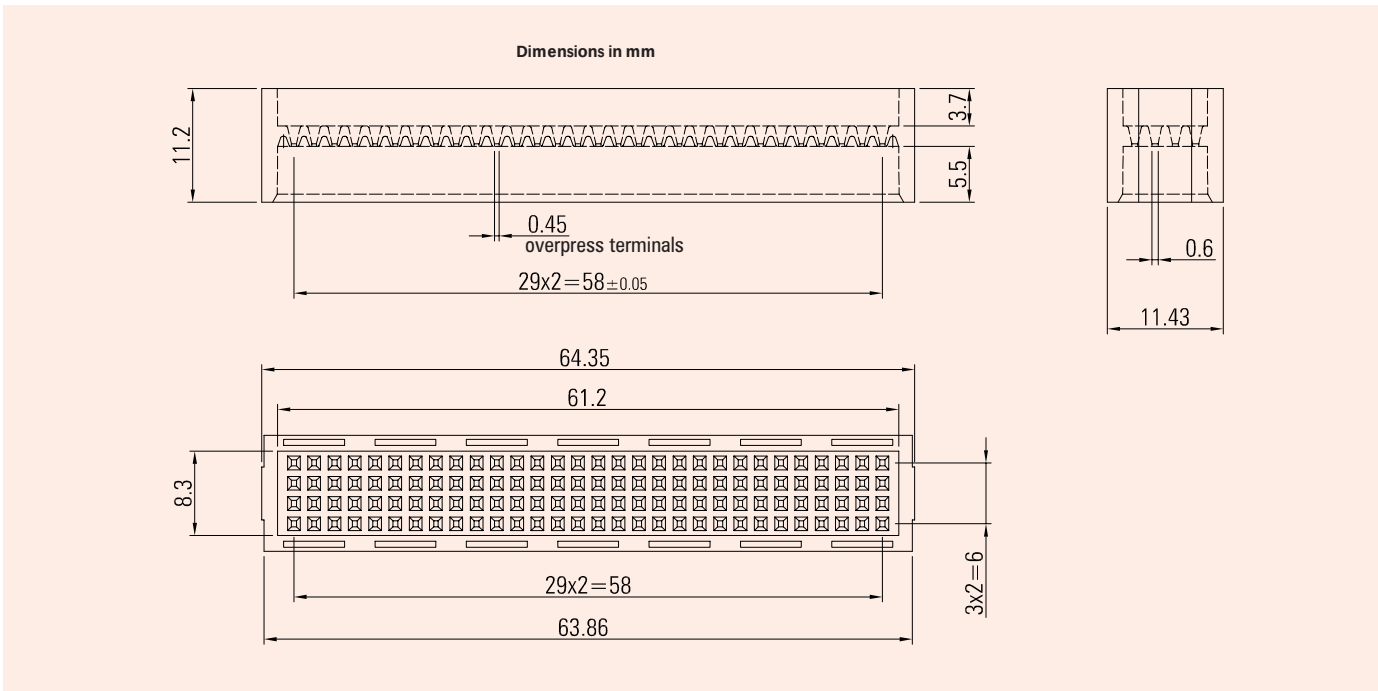
Straight headers, grid 2 mm



No. of Positions		60
Termination Methods	Quality Class	Part Number
	I	—
	II	—
	III	272-30000-31



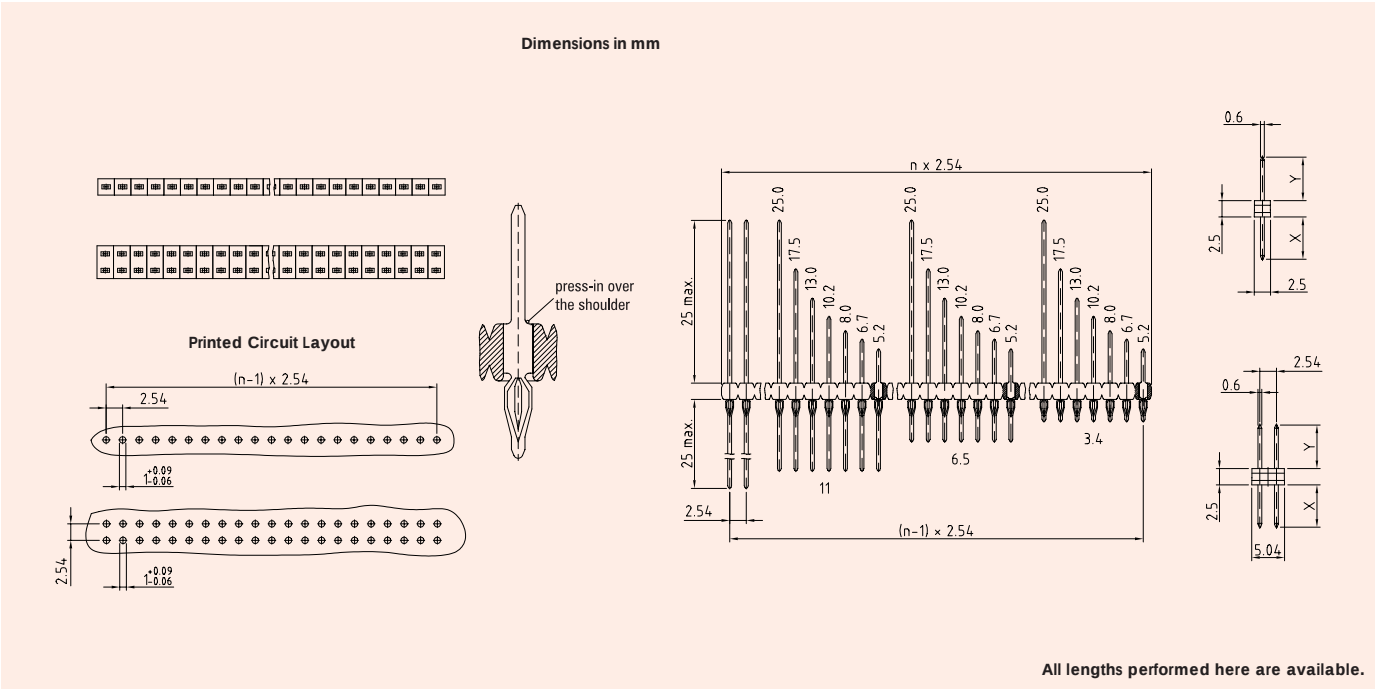
Shroud PC/104 Plus

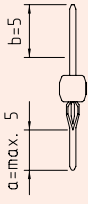


No. of Positions	120
Termination Methods	Part Number
Shrouds for PC/104 plus	264-17302



VarPol straight headers



max. Positions			54 (1-row)	108 (2-row)
Termination Methods	X	Y	Part Numbers	
	3,4	5,2	971-nn010-b1	972-nn010-b1
	3,4	6,7	971-nn009-b1	972-nn009-b1
	3,4	8,0	971-nn011-b1	972-nn011-b1
	3,4	10,2	971-nn012-b1	972-nn012-b1
	3,4	13,0	971-nn013-b1	972-nn013-b1
	3,4	25,0	971-nn019-b1	972-nn019-b1
	6,5	5,2	971-nn020-ba	972-nn020-ba
	6,5	6,7	971-nn039-ba	972-nn039-ba
	6,5	8,0	971-nn021-ba	972-nn021-ba
	6,5	10,2	971-nn022-ba	972-nn022-ba
	6,5	13,0	971-nn023-ba	972-nn023-ba
	6,5	25,0	971-nn029-ba	972-nn029-ba

On request: Other pin length — Insertion tool 5.9

nn = No. of position per row
a = contact surface X-side
b = contact surface Y-side (contact area)

Contact surface a and b:

- 1 = 1,27-4 µm Ni
- 2 = 0,8 µm Au over 1,27-4 µm Ni
- 3 = 0,15 µm Au over 1,27-4 µm Ni
- 4 = 3,5 µm Sn over 1,27-4 µm Ni

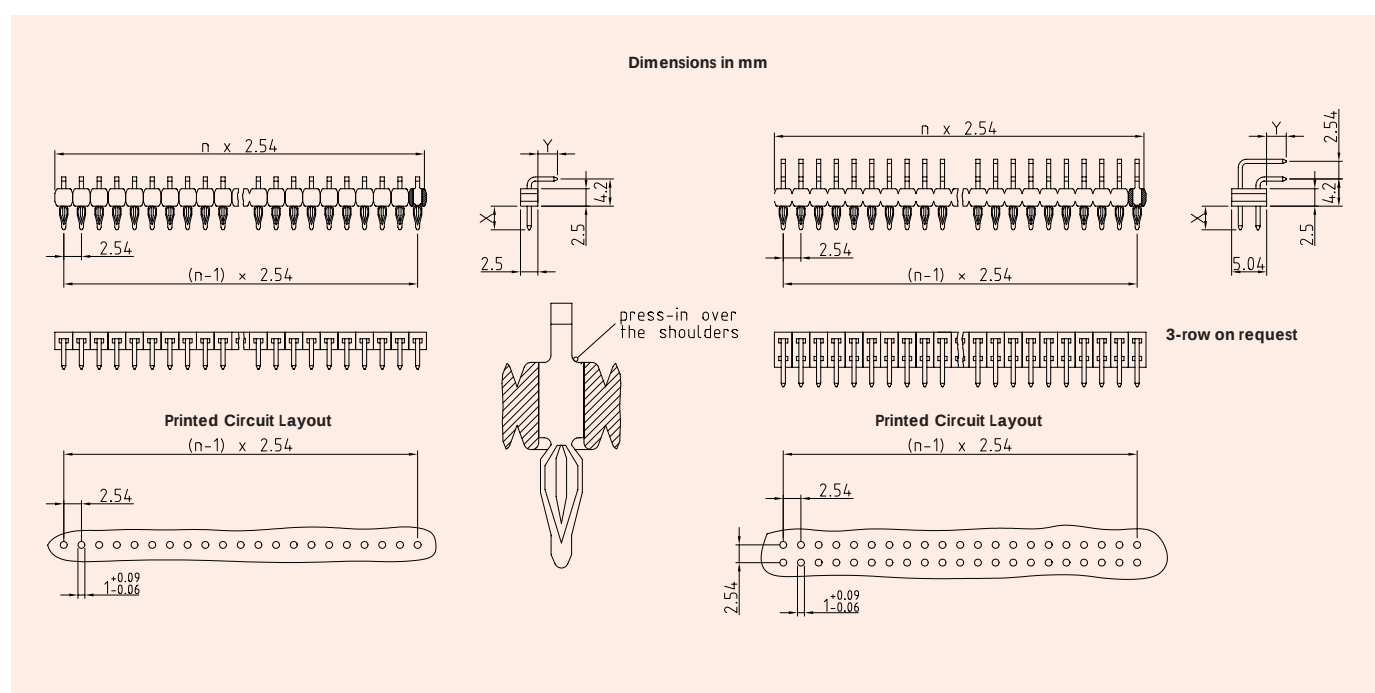
Ordering example:

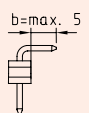
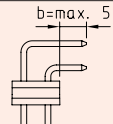
1-row, 30 Pins, x=3,4 mm, y=5,2 mm,
contact surface a = 1,27-4 µm Ni,
contact surface b = 0,8 µm Au over 1,27-4 µm Ni
Part No. **971-30010-21**

The mentioned datas are nominal datas



VarPol right angle headers



max. Pins			54 (1-row)
Termination Methods	X	Y	Part Numbers
	3,4	2,8	981-nn010-b1
	3,4	5,6	981-nn011-b1
	3,4	2,8	982-nn010-b1
	3,4	5,6	982-nn011-b1

On request: Other pin length — Insertion tool see page 5.9

nn= No. of position per row
b= contact surface Y-side (contact area)

Contact surface:

1 = 1,27-4 μ m Ni
2 = 0,8 μ m Au over 1,27-4 μ m Ni
3 = 0,15 μ m Au over 1,27-4 μ m Ni
4 = 3,5 μ m Sn over 1,27-4 μ m Ni

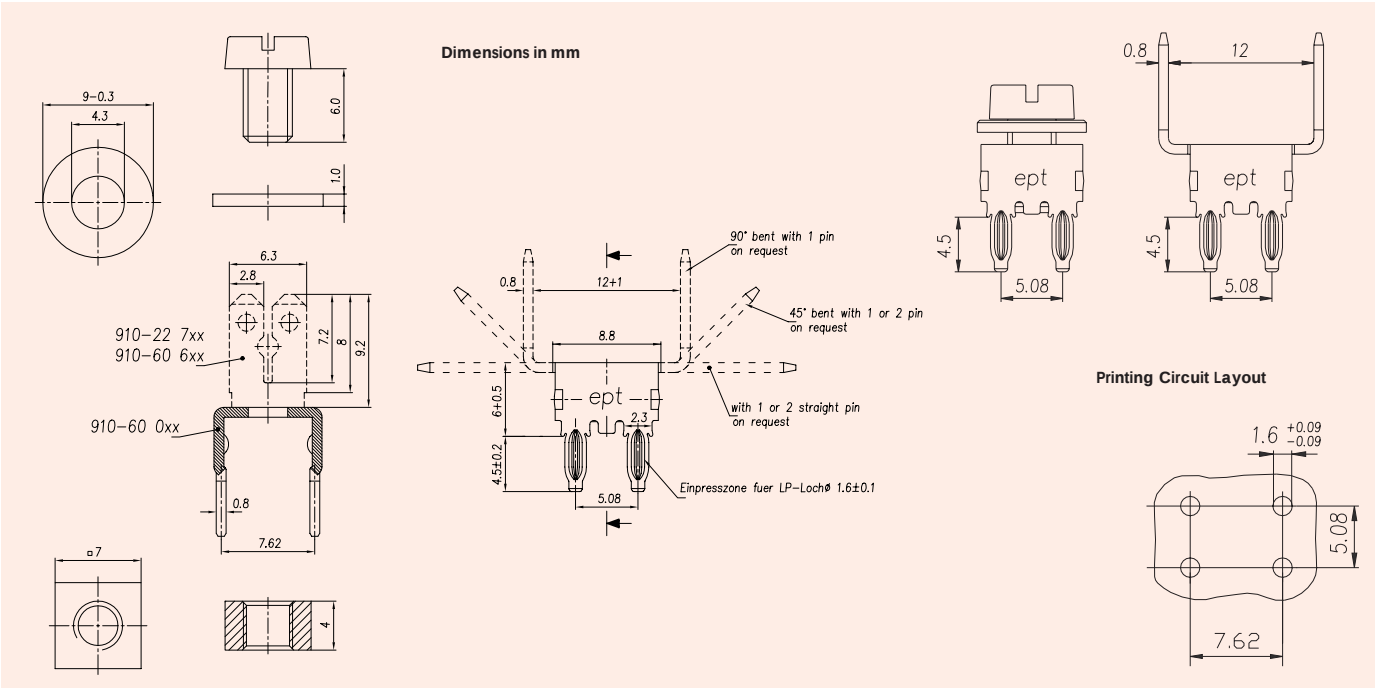
Ordering example:

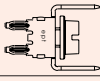
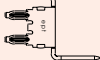
1-row, 30 pins, x=3,4 mm, y=2,8 mm, contact surface X-side 1,27-4 μ m Ni, contact surface Y-side 0,8 μ m Au over 1,27-4 μ m Ni
Part No. **981-30010-21**

The mentioned datas are nominal datas



Power Terminal grid 5,08x7,62 mm



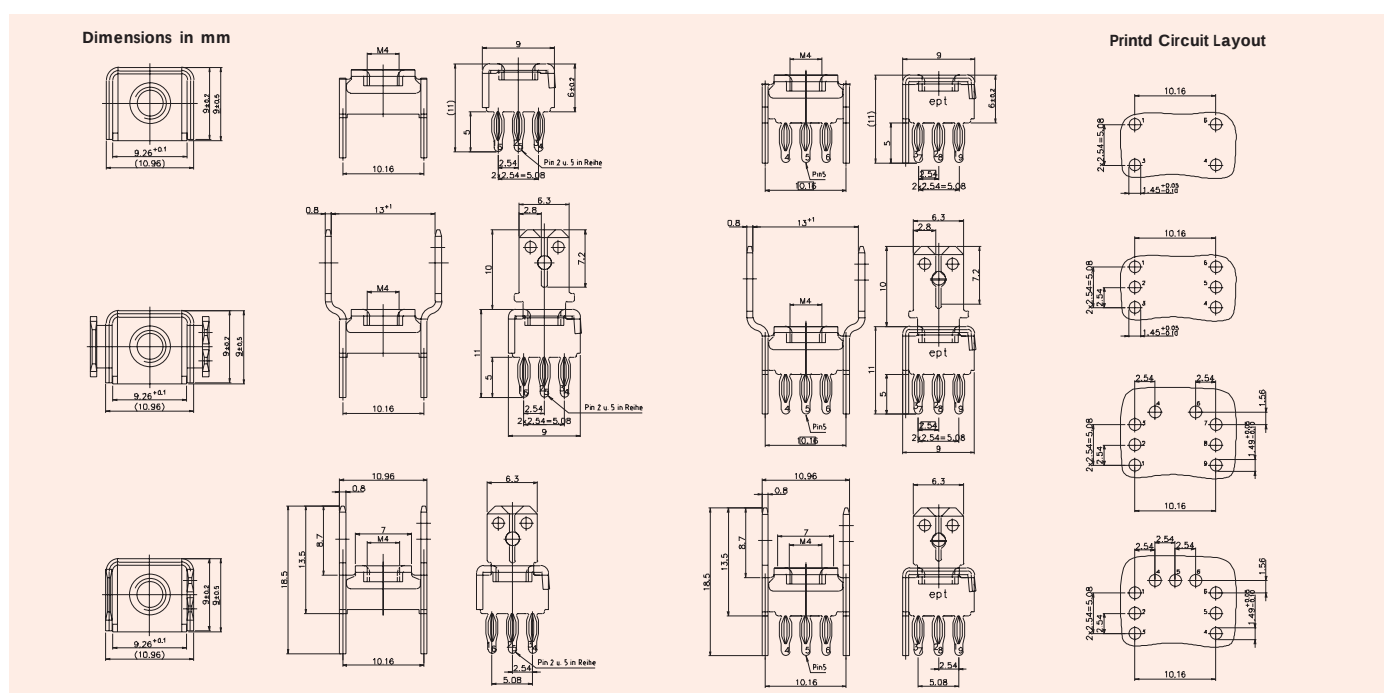
No. of Positions	4	
Thread	M4	M5
Type	Part Numbers	
	910-60045	910-60050
	910-22015	910-22020
	910-60645/1	910-60650/1
	910-22715/1	910-22720/1
Cylinder screw DIN 84 	910-20145	910-20150
clutch disk 	910-20320	910-20330
click - nut 	910-20015	910-20020

Hole plating thickness see page 1.13 "Technical Notes"

Insertion tool:
Part No. 886-600



Power Terminal grid 5,08x10,16 mm



Specifications

Contact Surface	2-8 μm SnPb
Thread	M 4
Operating Current	30 A / 6 Pin
Press-in Force	typ. 150 N / Pin
Extraction Force	min. 60 N / Pin
max. Torque	130 Ncm

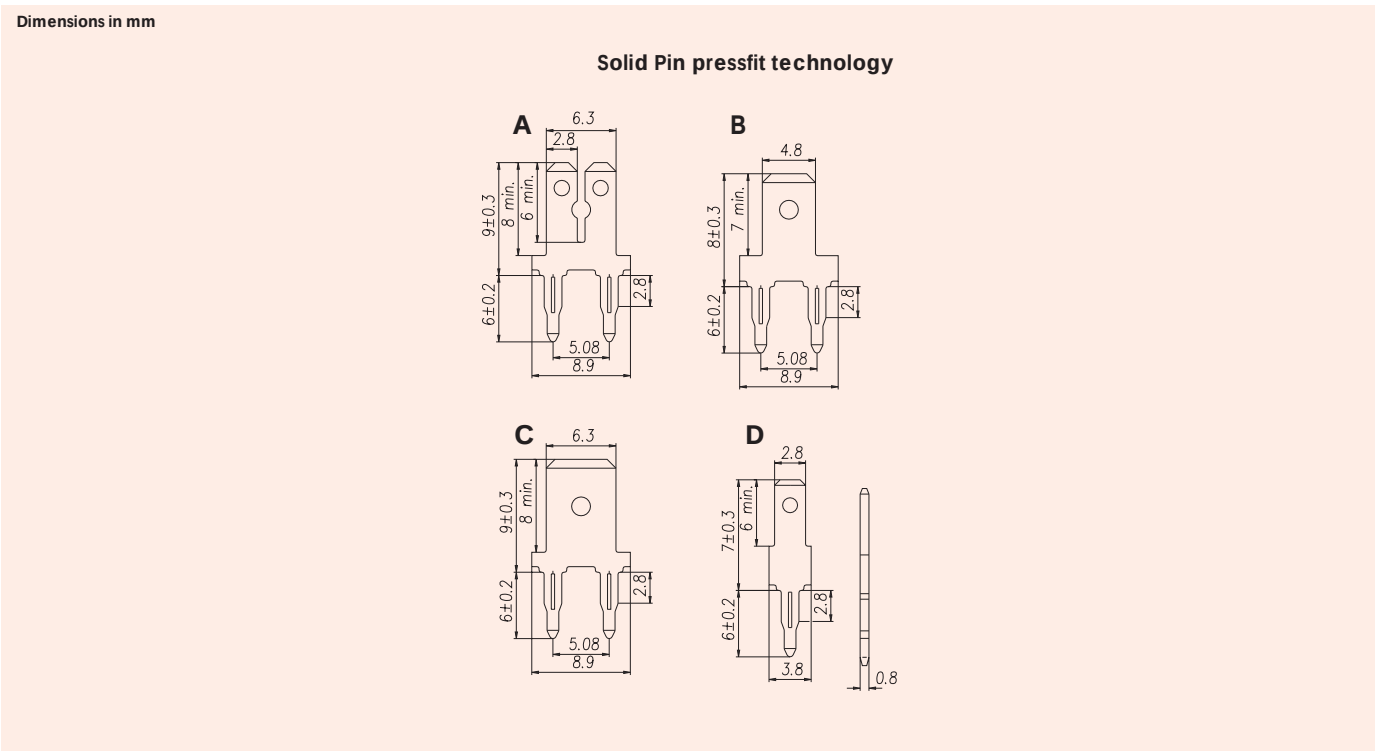
Hole plating thickness see page 1.13 "Technical Notes"

No. of Positions	4	6	8	9
Termination Methods	Part Numbers			
Power Terminal, thread and plug connection, bended	911-32044	911-32046	911-33048	911-33049
Power Terminal with thread	911-32004	911-32006	911-33008	911-33009
Power Terminal, thread and plug connection	911-3224	911-32246	911-33248	911-33249

Insertion tool: Part No. **886-601-1** for Power Terminal 911-320xx and 911-330xx
 Part No. **886-604** for Power Terminal 911-322xx and 911-332xx



Spade Terminals



Specifications

Contact Surface	2-8 µm SnPb
Press-in Force	Type A, B, C max. 600 N, Type D max. 300 N
Extraction Force	Type A, B, C min. 120 N, Type D min. 60 N
PCB hole diameter	Solid Pin 1,6 ^{+ 0,04} _{- 0,06} mm

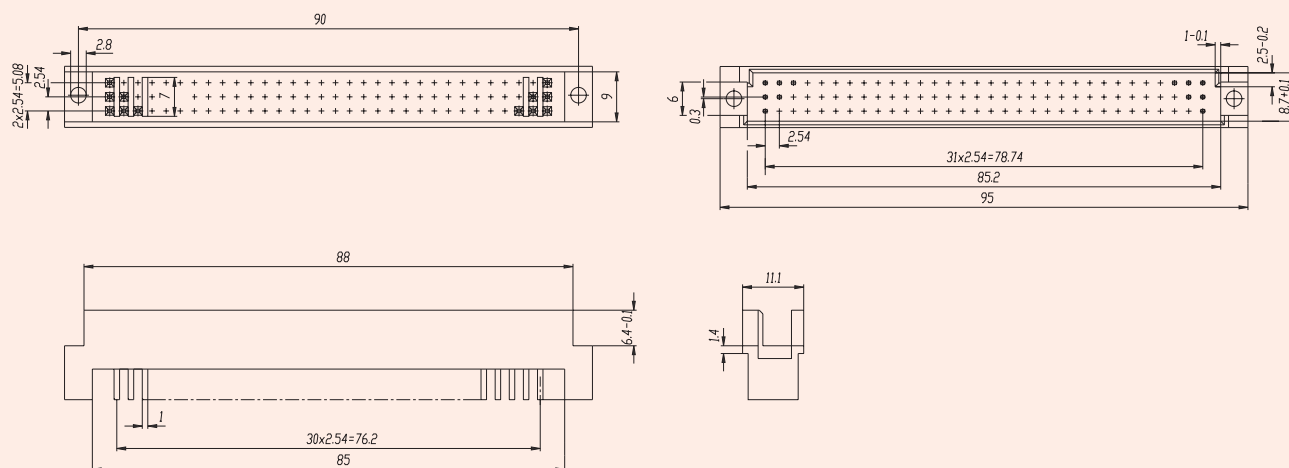
Type	A	B	C	D
Termination Methode	Part Numbers			
Solid Pin	090-10162	090-10161	090-10163	090-10164

Insertion tool: Part No. 884-650



Shrouds for Type C and R

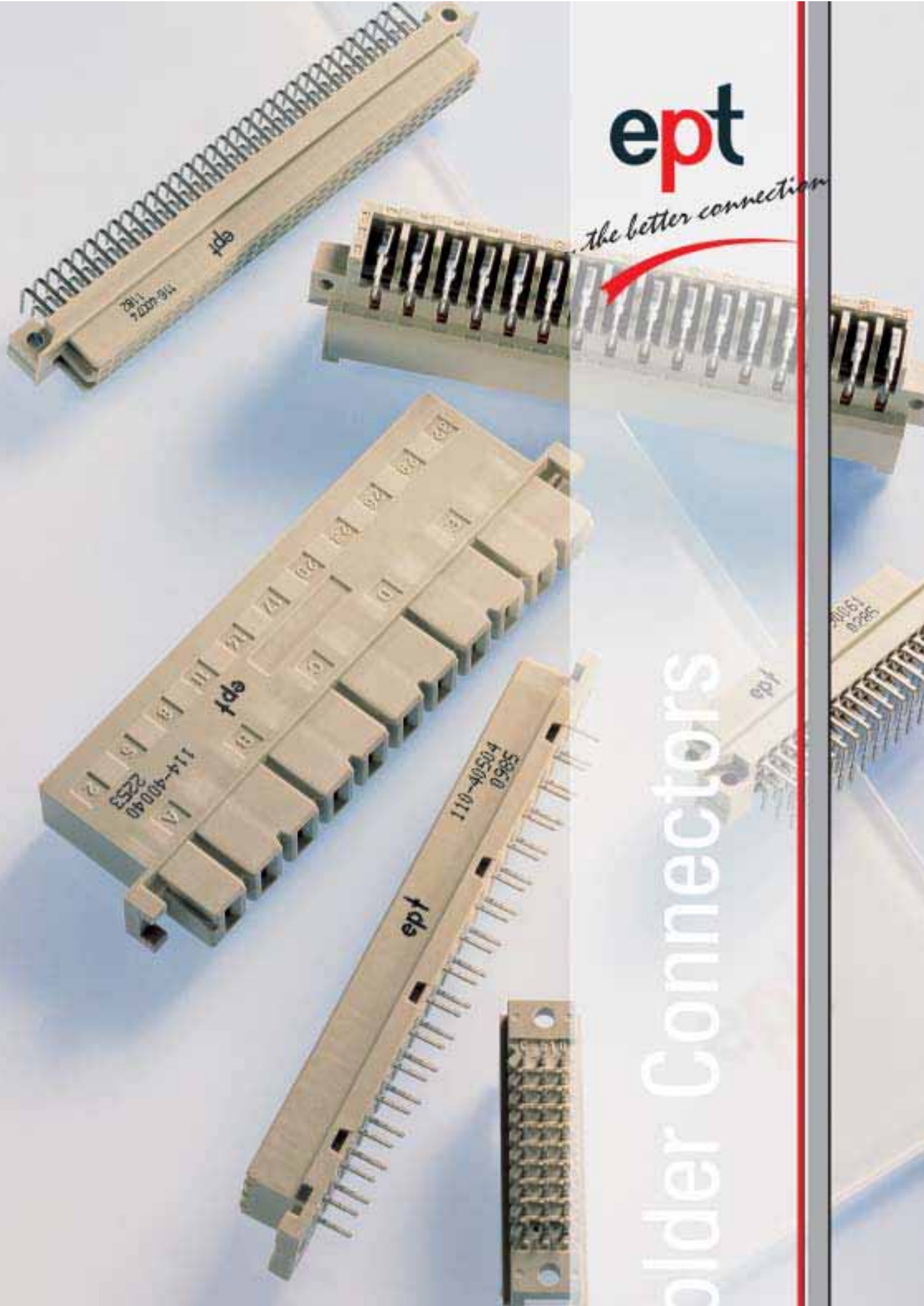
Dimensions in mm



PCB-thickness	2,4 mm	3,2 mm
Pin length	Part Numbers	
13 mm	115-15401N	115-15402N
17 mm	115-15301N	115-15302N

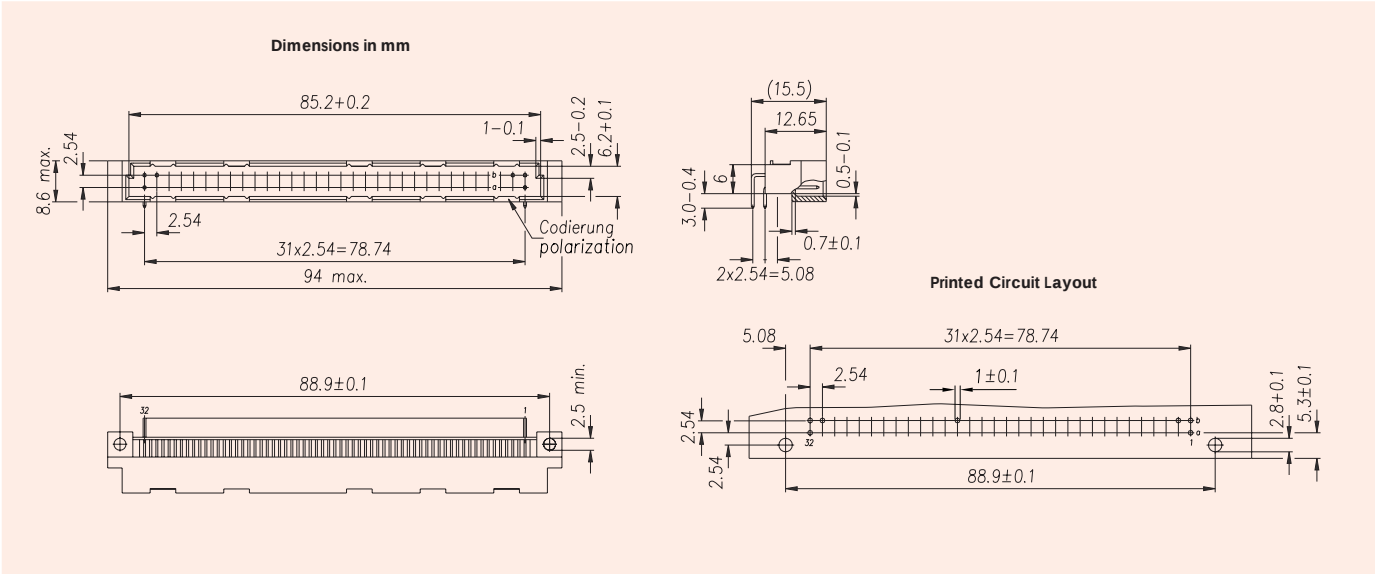


the better connection





Male Connectors Type B

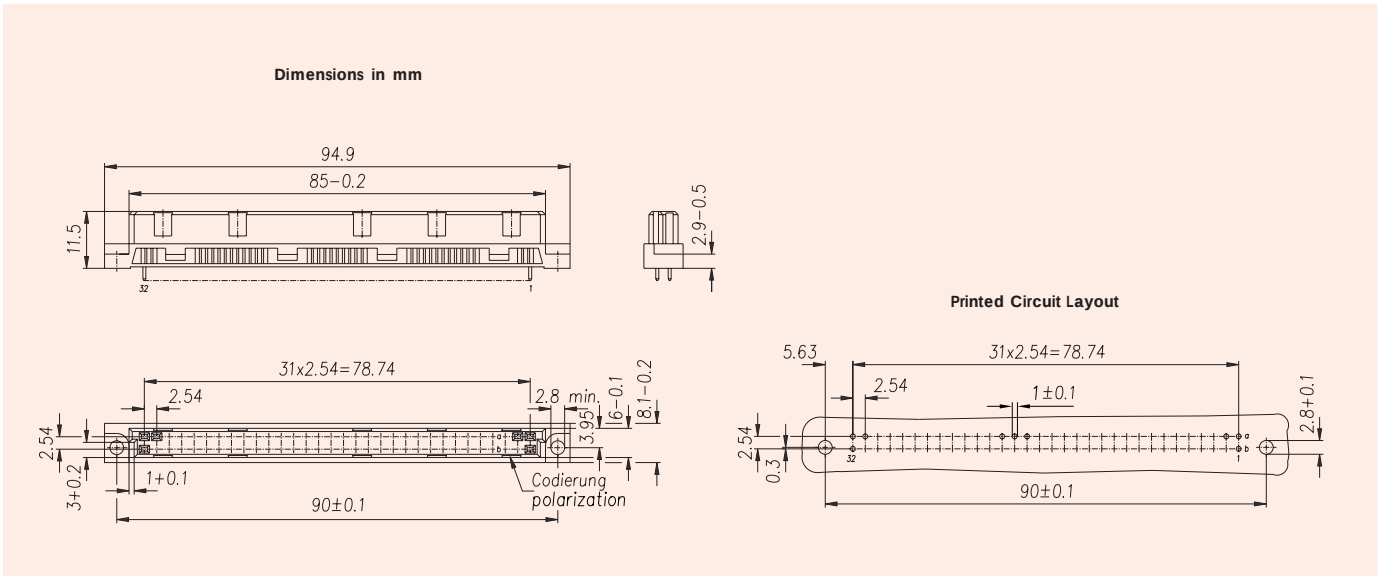


No. of Positions		32	64
Position		Row a,b (2,4,6,...)	Row a,b
Termination Methods	Quality Class	Part Numbers	
	II	101-40024	101-40064
	II	101-40025	101-40065
Special Length			
	II	101-40044	101-40074

On request: * Terminals Au/Ni Part No. 101-45... — Terminal pin Ø 0,635 mm — Premating contacts — Special assembly possible — THTR- technology available



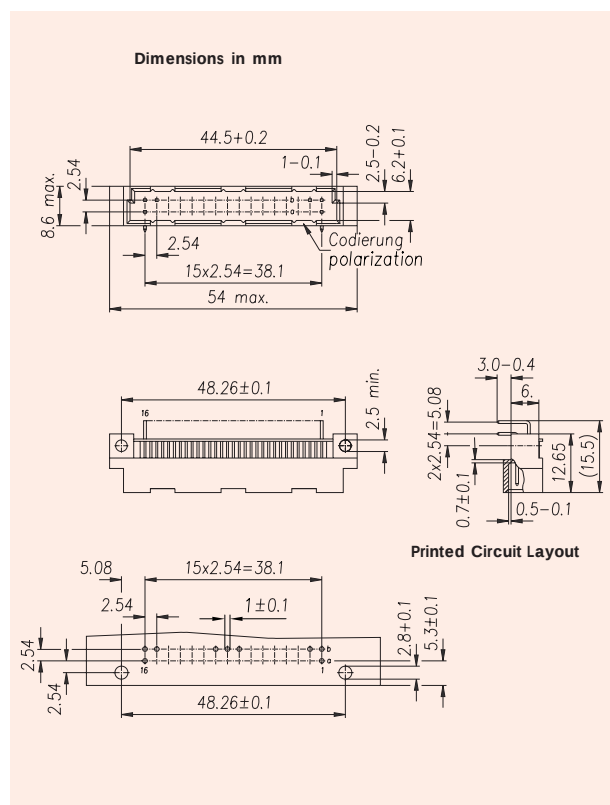
Female Connectors Type B



No. of Positions		32	64
Position		Row a,b (2,4,6,...)	Row a,b
Termination Methods	Quality Class	Part Numbers	
	II	102-40024	102-40064
	II	102-40025	102-40065
	II	102-40026	102-40066
hand soldering connection	II	102-40044	102-40074

On request: * Terminals Au/Ni Part No. 102-45... — Terminal pin Ø 0,65 mm — with/without mounting flange — other pin length — other quality class — THTR- technology available

Type B/2

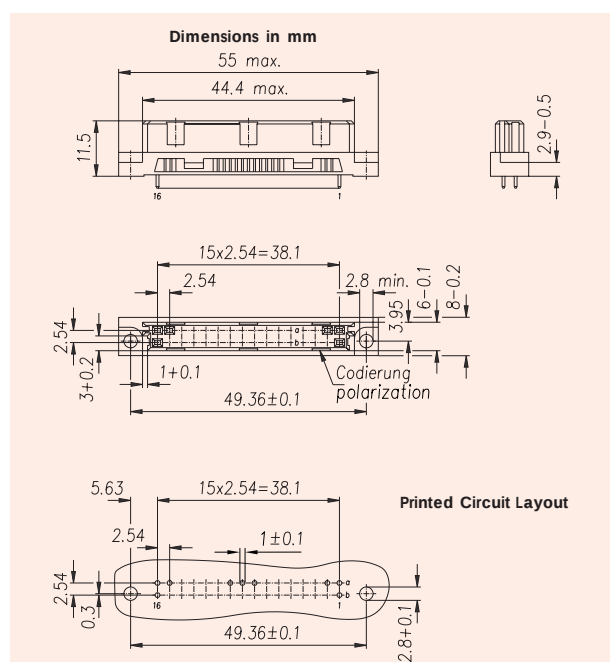


Male Connectors



No. of Positions		16	32
Position		Row a,b (2,4,6,...)	Row a,b
Termination Methods	Quality Class	Part Numbers	
	II	101-90004	101-90014
	II	101-90115	101-90105
Special Length			
	II	101-90006	101-90016

On request: * Terminals Au/Ni Part No. 101-95... — Terminal pin Ø 0,635 mm
Premating contacts — Special assembly possible — other quality class



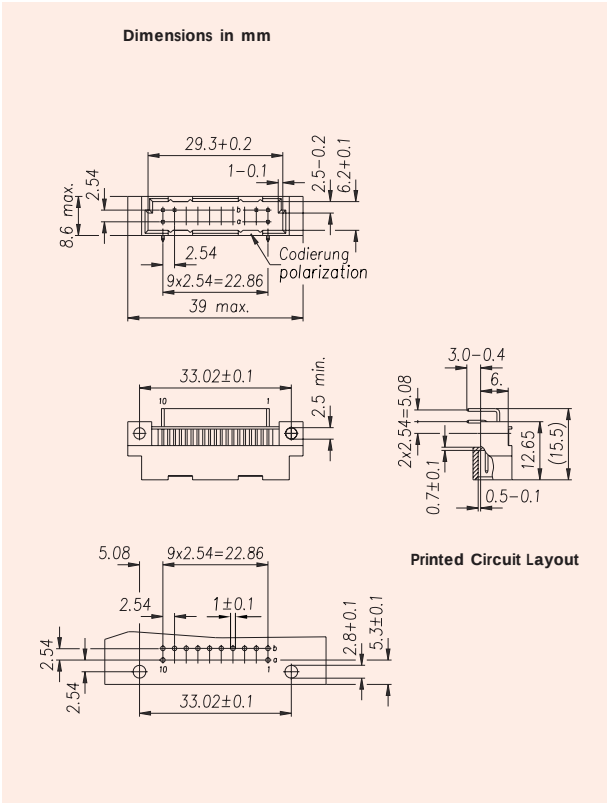
Female Connectors

No. of Positions		16	32
Position		Row a,b (2,4,6,...)	Row a,b
Termination Methods	Quality Class	Part Numbers	
	II	102-90004	102-90064
	II	102-90005	102-90065
	II	102-90006	102-90066
hand soldering connection	II	102-90025	102-90075

On request: * Terminals Au/Ni Part No. 102-95... — with/without mounting flange
other pin length — Terminal pin Ø 0,65 mm — other quality class
THTR-technology available



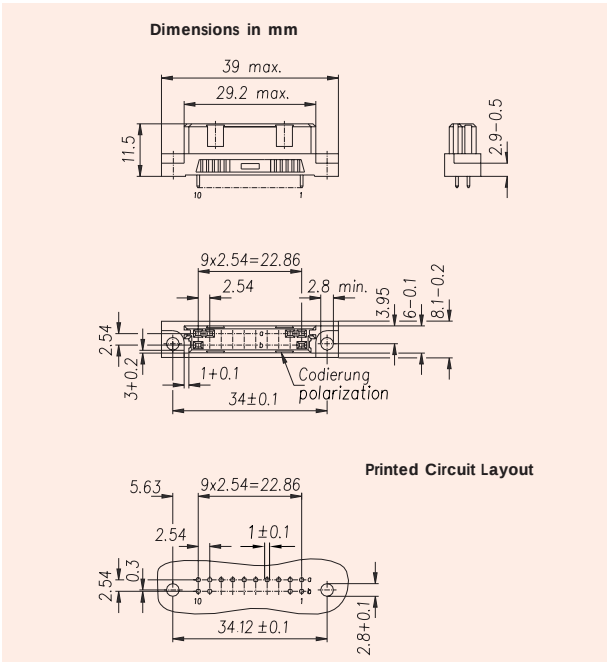
Type B/3



Male Connectors

No. of Positions		10	20
Position		Row a,b (2,4,6,...)	Row a,b
Termination Methods	Quality Class	Part Numbers	
	II	101-80004	101-80014
	II	101-80105	101-80115
Special Length			
	II	101-80006	101-80016

On request: * Terminals Au/Ni Part No. 101-85... — Premating contacts —
Special assembly possible — Terminal pin Ø 0,635 mm —
other quality class



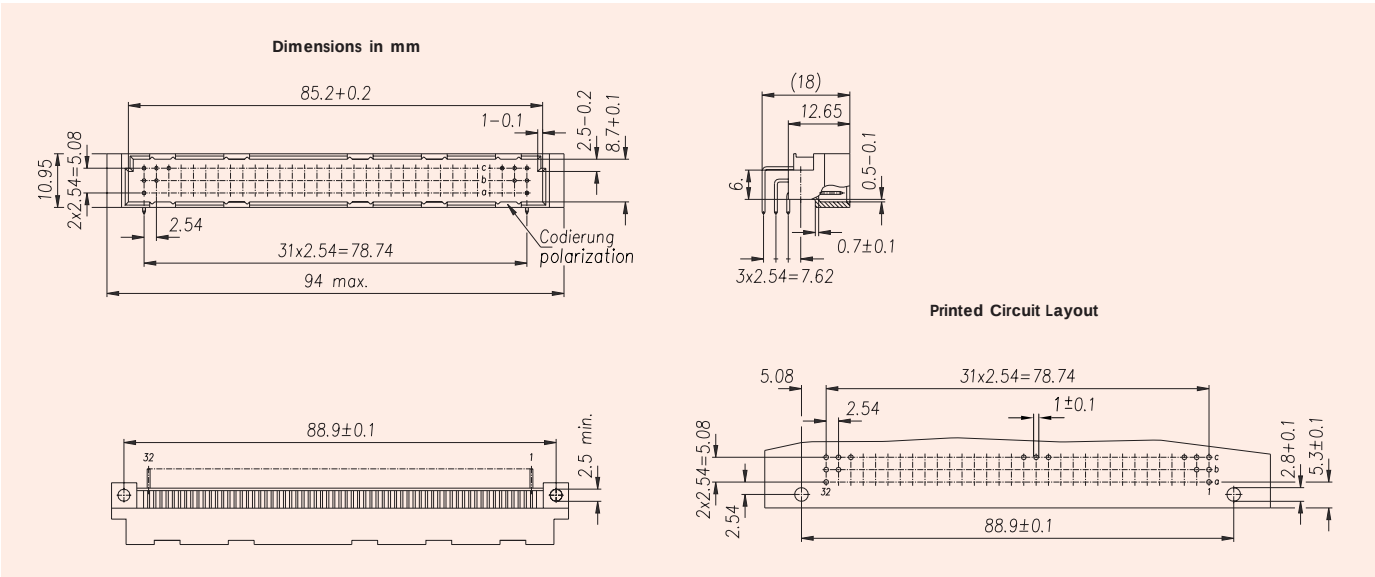
Female Connectors

No. of Positions		10	20
Position		Row a,b (2,4,6,...)	Row a,b
Termination Methods	Quality Class	Part Numbers	
	II	102-80004	102-80064
	II	102-80005	102-80065
	II	102-80006	102-80066
hand soldering connection	II	102-80025	102-80075

On request: * Terminals Au/Ni Part No. 102-85... — with/without mounting flange —
Terminal pin Ø 0,65 mm — other pin length — other quality class
THTR- technology available



Male Connectors Type C

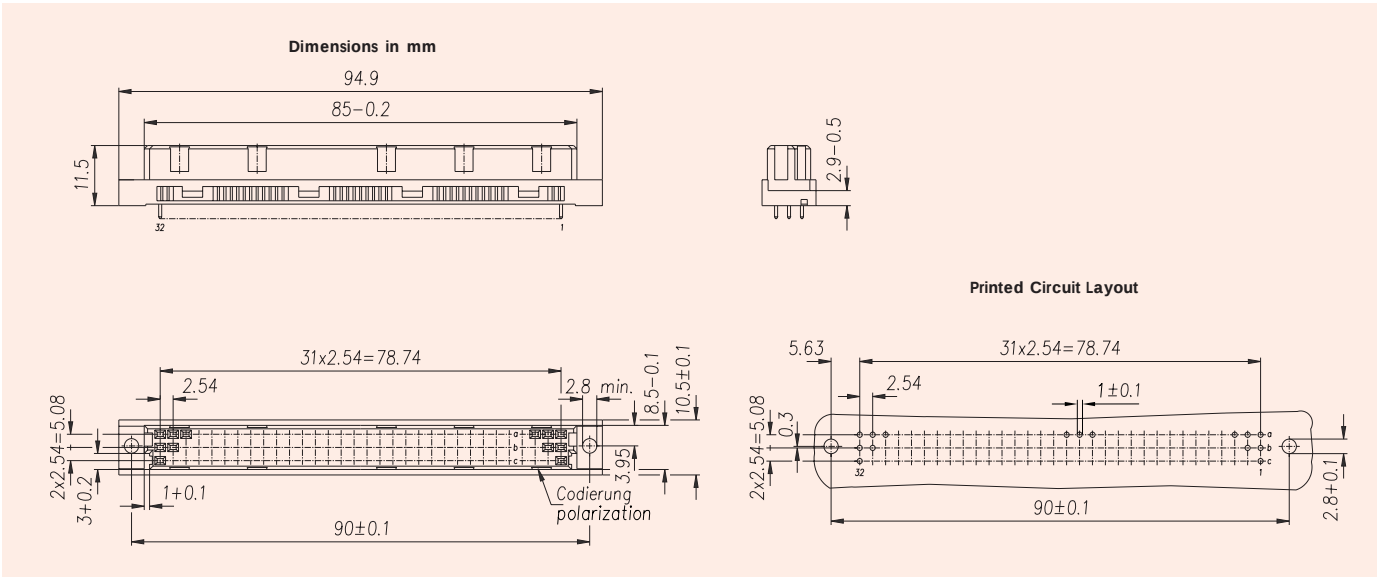


No. of Positions		32	48	64	96
Position		Row a,c (2,4,6,...)	Row a,b,c (2,4,6,...)	Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers			
	II	103-40014	103-40024	103-40034	103-40064
	II	103-40015	103-40025	103-40035	103-40065
Special Length					
	II	103-40194	103-40144	103-40154	103-40174

On request: * Terminals Au/Ni Part No. 103-45... — Premating contacts — Special assembly possible — Terminal pin Ø 0,635 mm — other quality class
THTR- technology available



Female Connectors Type C

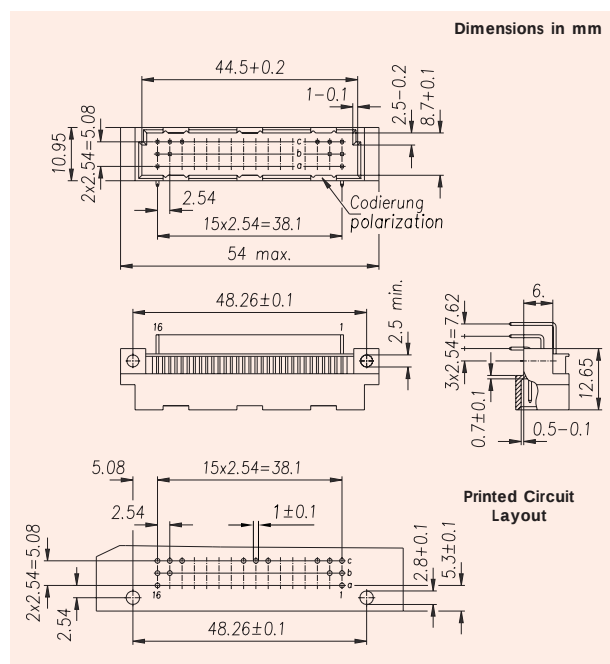


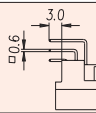
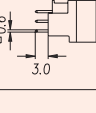
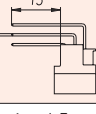
No. of Positions		32	48	64	96
Position		Row a,c (2,4,6,...)	Row a,b,c (2,4,6,...)	Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers			
	II	104-40014	104-40044	104-40054	104-40064
	II	104-40015	104-40045	104-40055	104-40065
	II *	104-40016	104-40046	104-40056	104-40066
	II *	104-40194	104-40144	104-40154	104-40174
hand soldering connection 	II	—	—	104-40115	104-40075

On request: * Terminals Au/Ni Part No. 104-45... — with/without mounting flange — Terminal pin Ø 0,65 mm — other pin length — other quality class
THTR- technology available

Type C/2

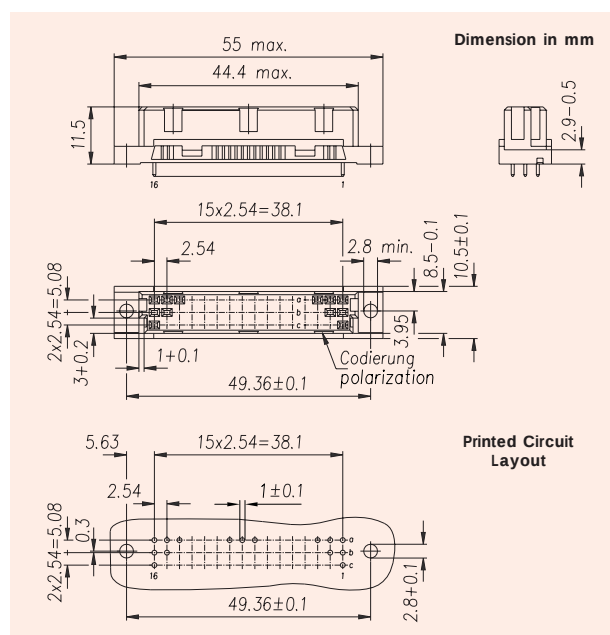
Male Connectors

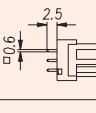
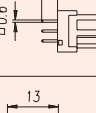
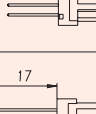
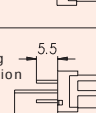


No. of Positions		16	32	48
Position		Row a, c (2,4,6..)	Row a, c	Row a, b, c
Termination Methods	Quality	Part Numbers		
	II	103-90004	103-90014	103-90064
	II	103-90105	103-90115	103-90165
Special Length				
	II	103-90006	103-90016	103-90066

On request: * Terminals Au/Ni Part No. 103-95... — Premating contacts —
Special assembly possible — Terminal pin Ø 0,635 mm —
other quality class

Female Connectors



No. of Positions		16	32	48
Position		Row a, c (2,4,6..)	Row a, c	Row a, b, c
Termination Methods	Quality	Part Numbers		
	II	104-90004	104-90014	104-90064
	II	104-90005	104-90015	104-90065
	II	104-90006	104-90016	104-90066
	II	104-90194	104-90154	104-90174
hand soldering connection	II	—	104-90035	104-90075

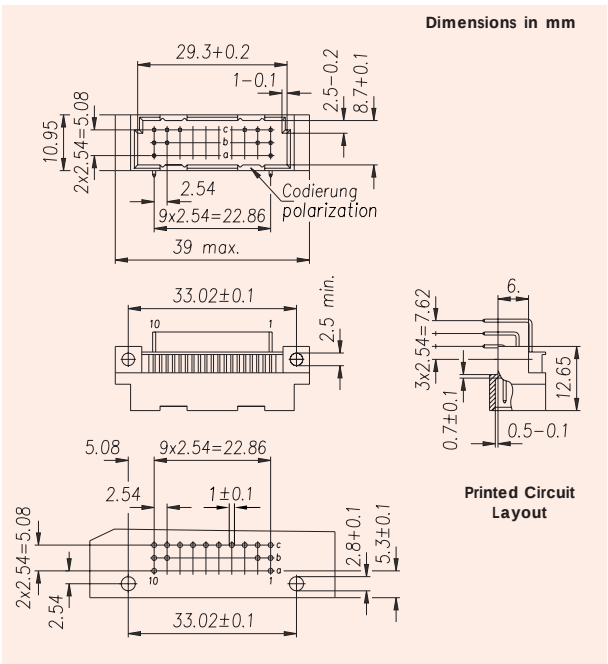
On request: * Terminals Au/Ni Part No. 104-95... — with/without mounting flange —
Terminal pin Ø 0,65 mm — other pin length — other quality class

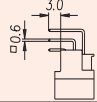
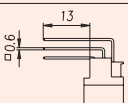
THTR- technology available



Type C/3

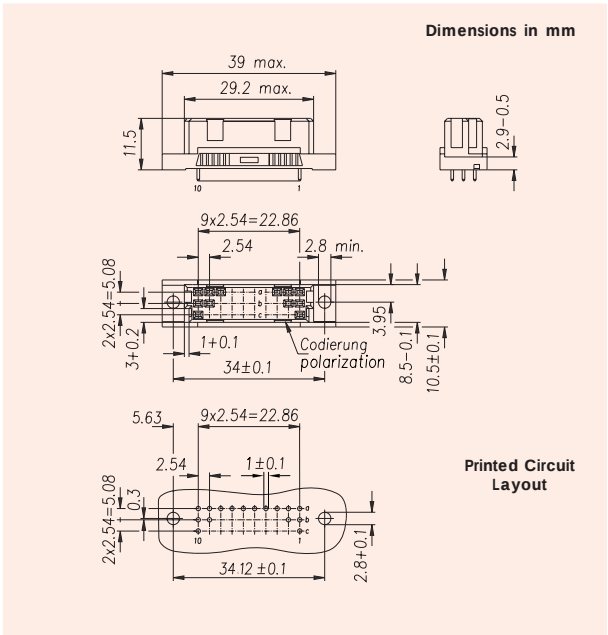
Male Connectors

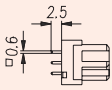
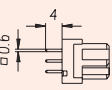
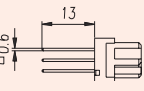
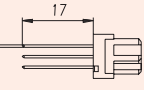


No. of Positions		20	30
Position		Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers	
	II	103-80014	103-80004
	II	103-80255	103-80265
Special Length			
	II	103-80016	103-80006

On request: * Terminals Au/Ni Part No. 103-85... — Premating contacts —
Special assembly possible — Terminal pin Ø 0,635 mm —
other quality class

Female Connectors



No. of Positions		20	30
Position		Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers	
	II	104-80014	104-80064
	II	104-80015	104-80065
	II	104-80016	104-80066
	II	104-80154	104-80174
hand soldering connection 	II	104-80035	104-80075

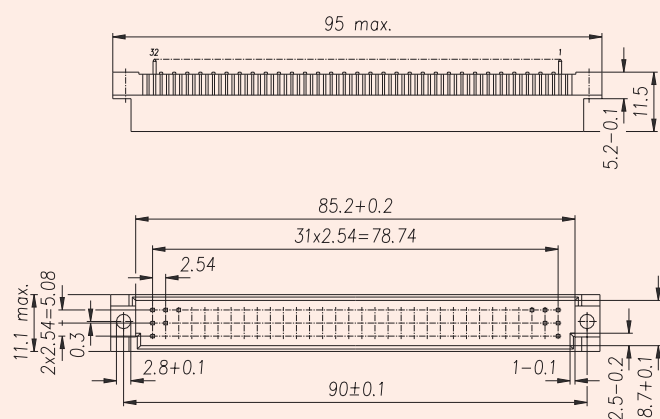
On request: * Terminals Au/Ni Part No. 104-85... — with/without mounting flange —
Terminal pin Ø 0,65 mm — other pin length — other quality class

THTR- technology available

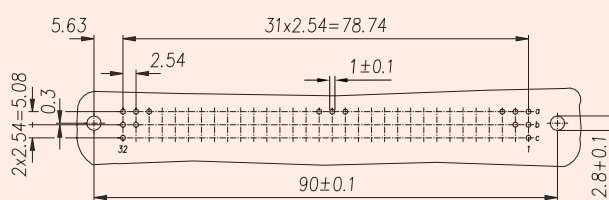


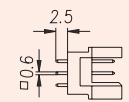
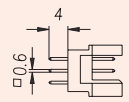
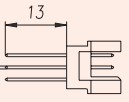
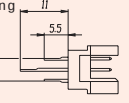
Male Connectors Type R

Dimensions in mm



Printed Circuit Layout

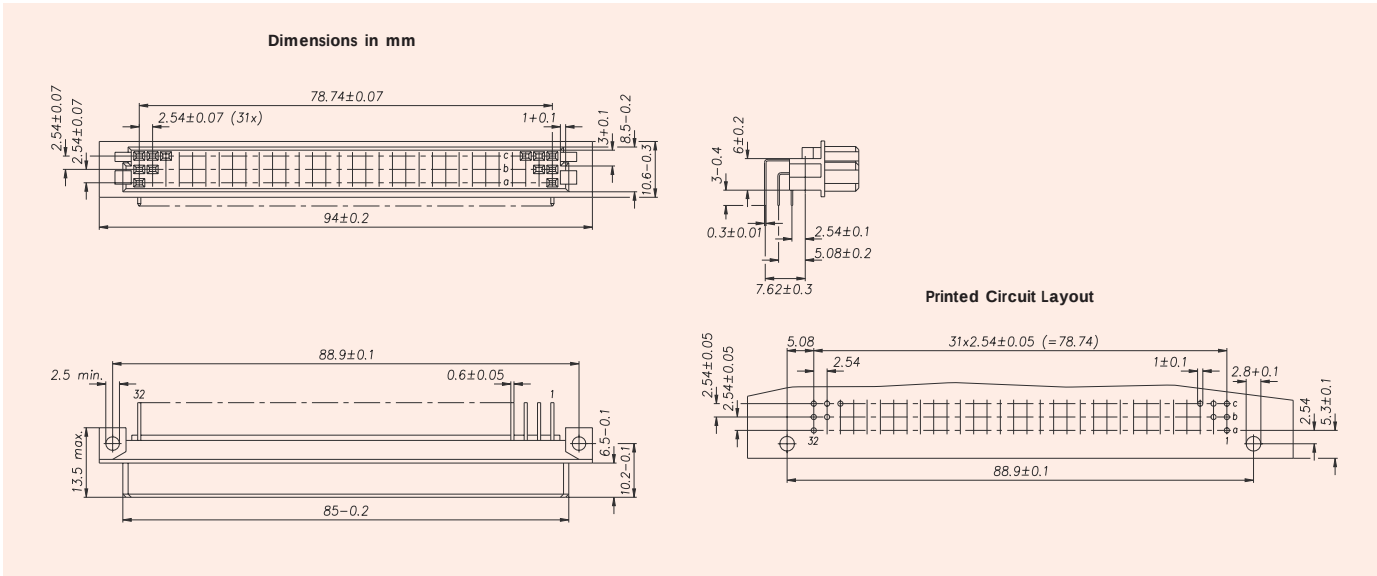


No. of Positions		32	48	64	96
Position		Row a,c (2,4,6,...)	Row a,b,c (2,4,6,...)	Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers			
	II	115-40015	115-40026	115-40035	115-40065
	II	115-40046	115-40025	115-40054	115-40074
	II *	115-40014	115-40024	115-40034	115-40064
hand soldering connection 	II	—	—	115-40036	115-40066

On request: * Terminals Au/Ni Part No. 115-45... — Premating contacts — Special assembly possible — other quality class
THTR- technology available



Female Connectors Type R

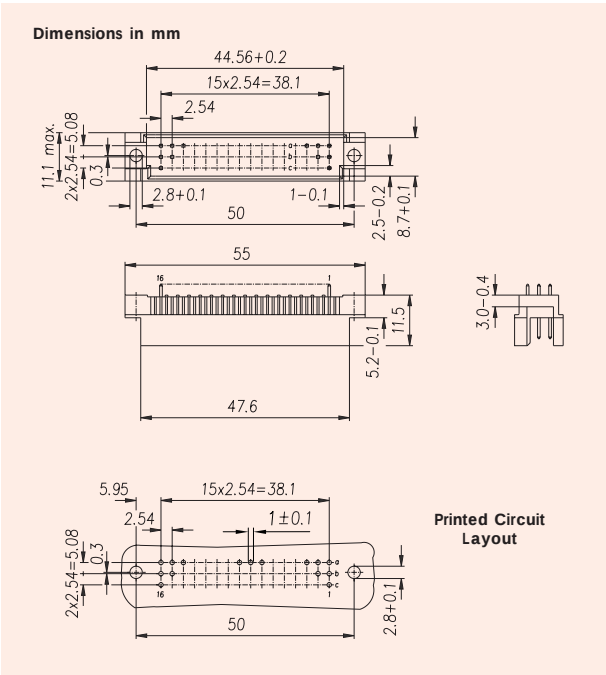


No. of Positions		32	48	64	96
Position		Row a,c (2,4,6,...)	Row a,b,c (2,4,6,...)	Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers			
	II	116-40034	116-40044	116-40054	116-40074

On request: with/without mounting flange — Special assembly possible — other quality class
THTR- technology available



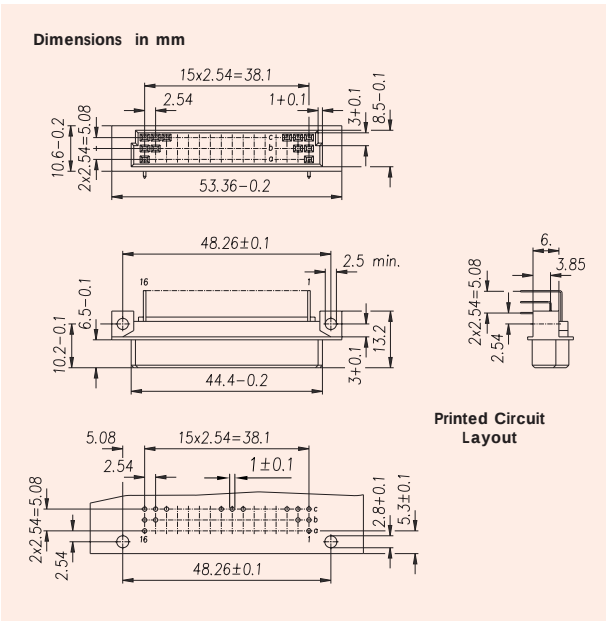
Type R/2



Male Connectors

No. of Positions		32	48
Position		Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers	
	II	115-90014	115-90064
	II	115-90015	115-90065
	II	115-90016	115-90066

* Terminals Au/Ni
On request: mating and premating contacts — other quality class



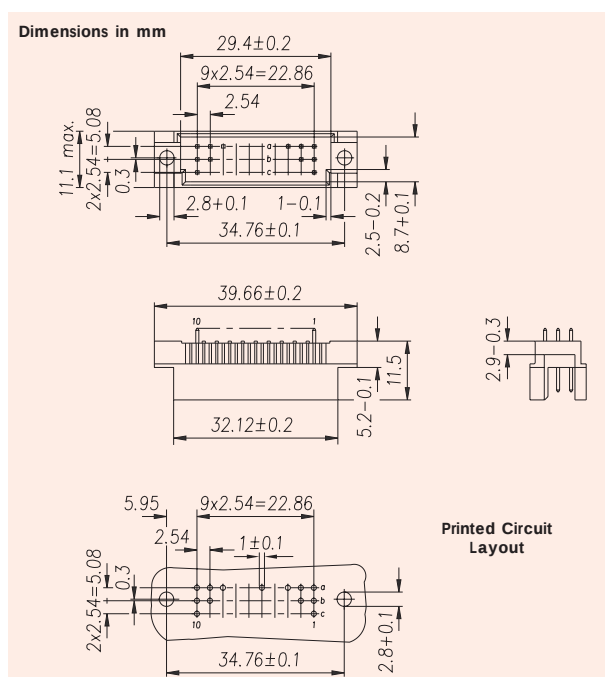
Female Connectors

No. of Positions		32	48
Position		Row a,c	Row a,b,c
Termination Methods	Quality Class	Part Numbers	
	I	116-90057	116-90067
	II	116-90054	116-90064
	III	116-90051	116-90061

THTR-technology available



Type R/3

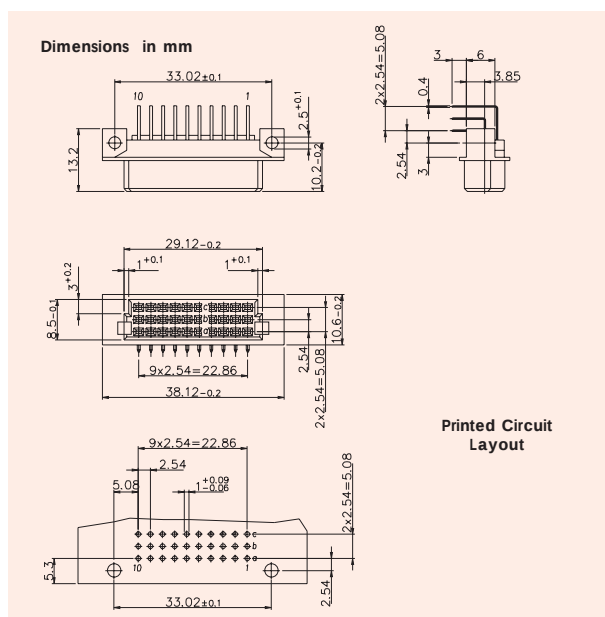


Male Connectors

No. of Positions		30
Position		Row a,b,c
Termination Methods	Quality Class	Part Numbers
	II	115-80064
	II	115-80065
	II	115-80066

* Terminals Au/Ni Part No. 115-85...

On request: Premating contacts — Special assembly possible — other quality class
THTR-technology available

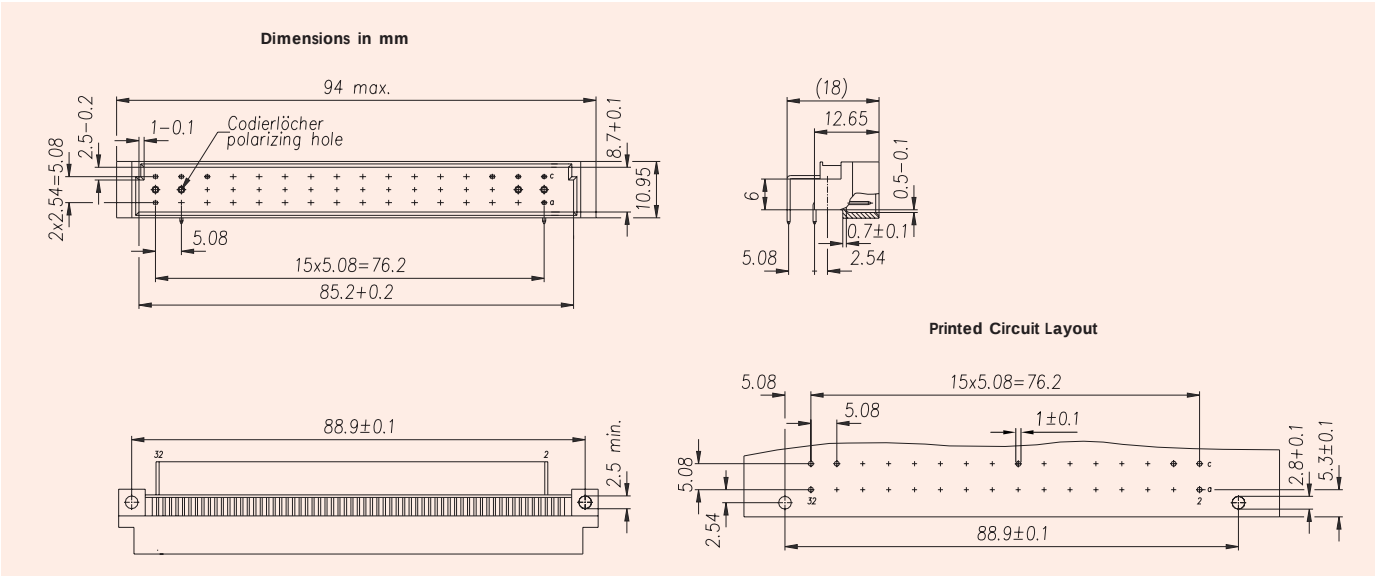


Female Connectors

No. of Positions		30
Position		Row a,b,c
Termination Methods	Quality Class	Part Numbers
	II	116-80064

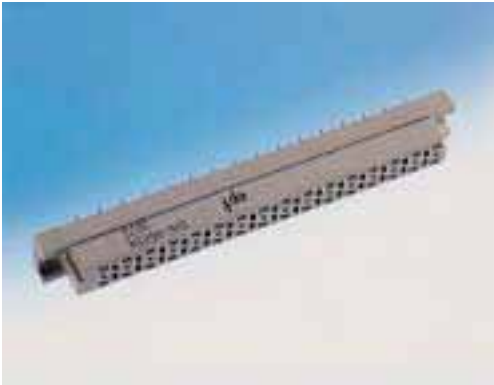


Male Connectors Type D

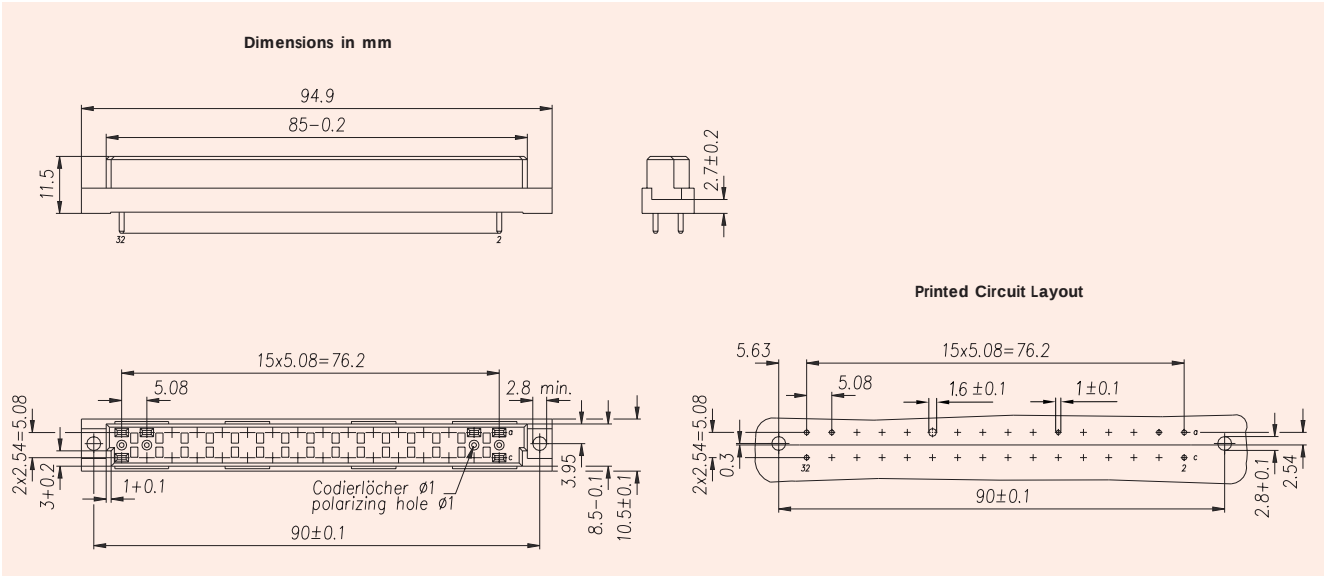


No. of Positions		16	32
Position		Row a,c (2,6,10,...)	Row a,c
Termination Methods	Quality Class	Part Numbers	
	II	105-40014	105-40064
	II	105-40016	105-40066

On request: Premating contact 0.8 mm — Special assembly possible — Coding pin (page 1.17) — other quality class — THTR- technology available



Female Connectors Type D

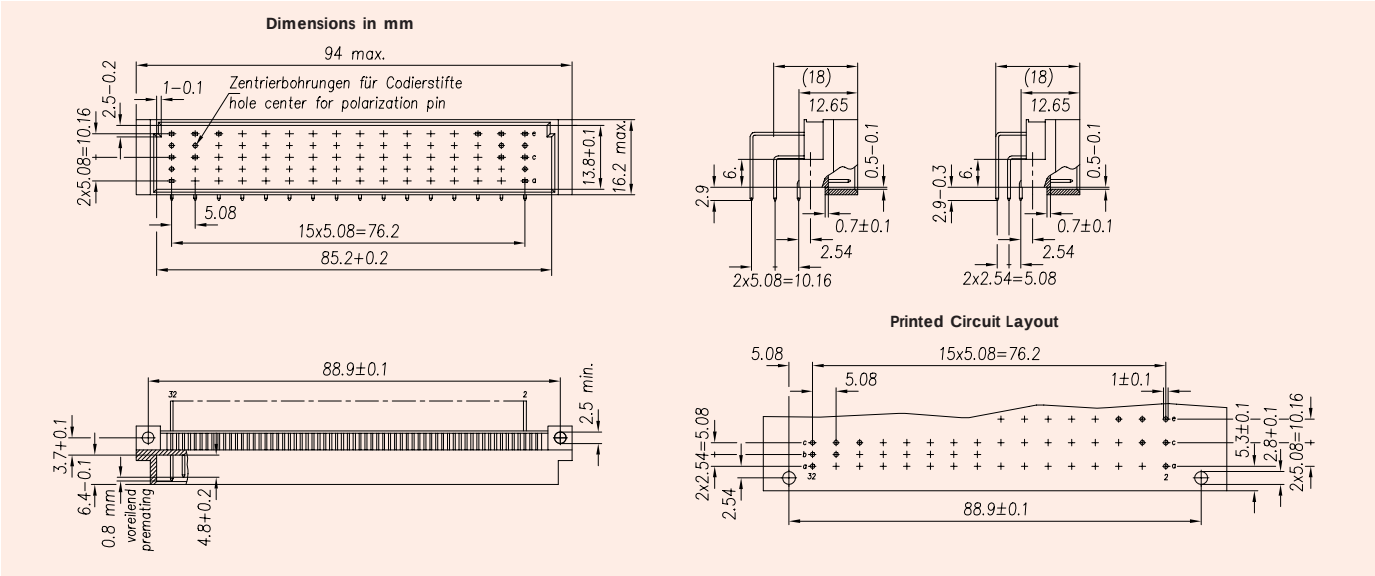


No. of Positions		32
Positions		Row a,c
Termination Methods	Quality Class	Part Numbers
	II	106-40064
	II	106-40065
	II	106-40084
	II	106-40075
hand soldering connection 	II	106-40066

On request: Coding pin (page 1.17) — other quality class — THTR- technology available

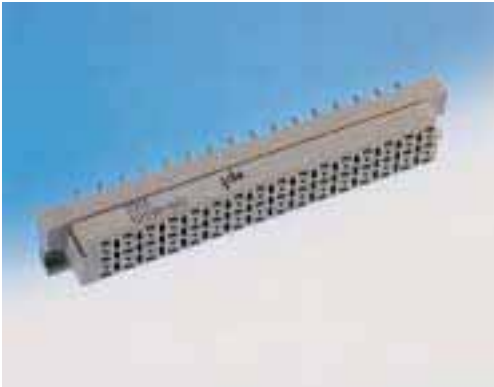


Male Connectors Type E

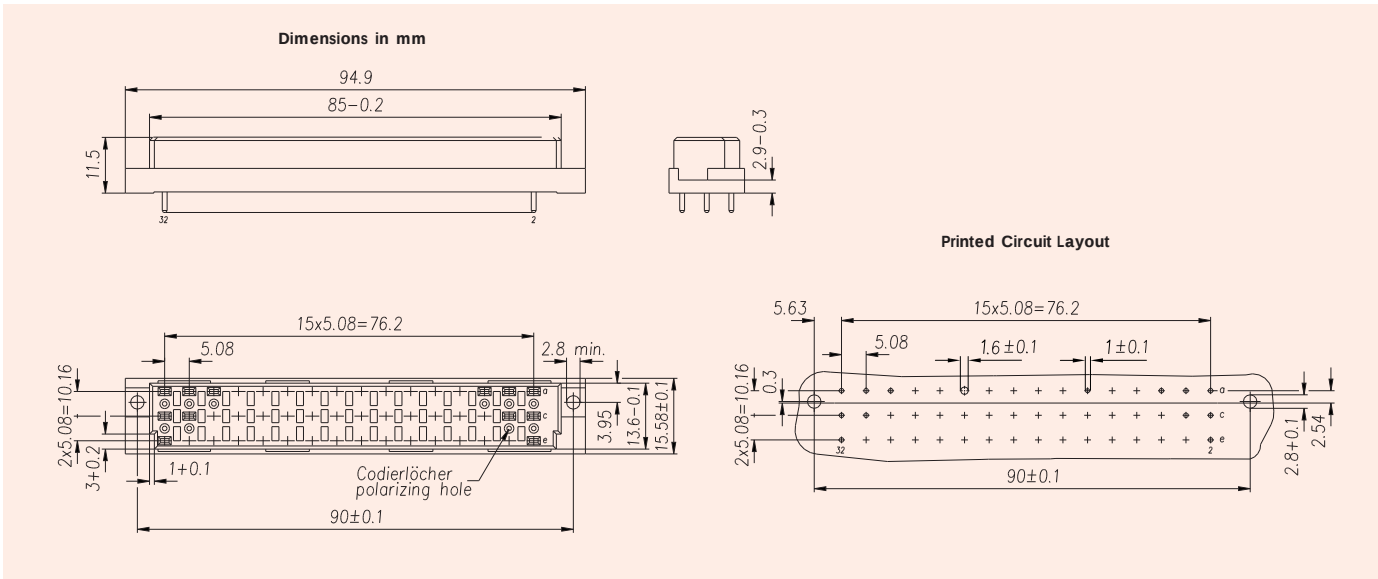


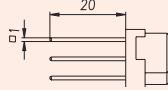
No. of Positions		32	32	48
Position		Row a, c	Row a, e	Row a, c, e
Termination Methods	Quality Class	Part Numbers		
	II	107-40024	107-40014	107-40064
	II	107-40025	107-40015	107-40065
	II	107-40026	107-40016	107-40066

On request: Premating contact 0,8 mm — Coding pin (page 1.17) — other quality class — THTR- technology available



Female Connectors Type E

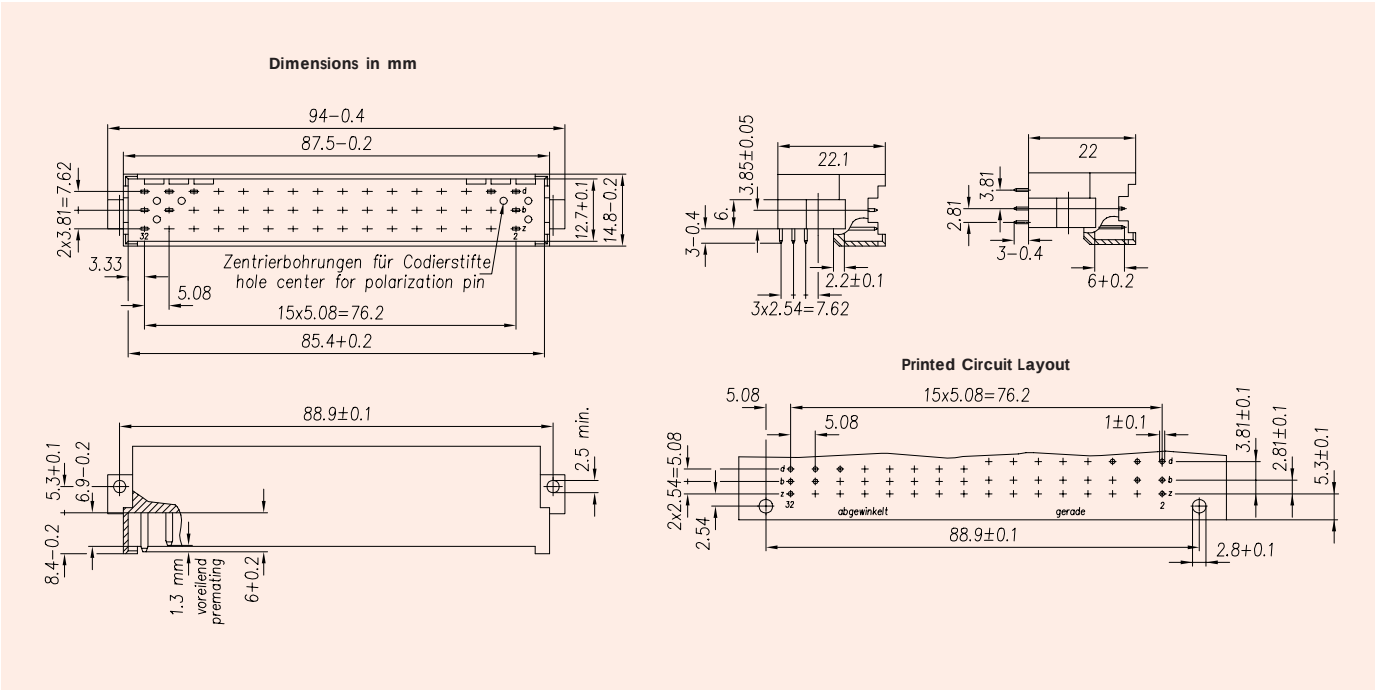


No. of Positions		32	32	48
Position		Row a,c	Row a,e	Row a,c,e
Termination Methods	Quality Class	Part Numbers		
	II	108-40014	108-40024	108-40064
	II	108-40015	108-40025	108-40065
	II	—	—	108-40084
	II	108-40044	108-40034	108-40074
hand soldering connection 	II	108-40046	108-40036	108-40076

On request: Coding pin (page 1.17) — other quality class — THTR- technology available

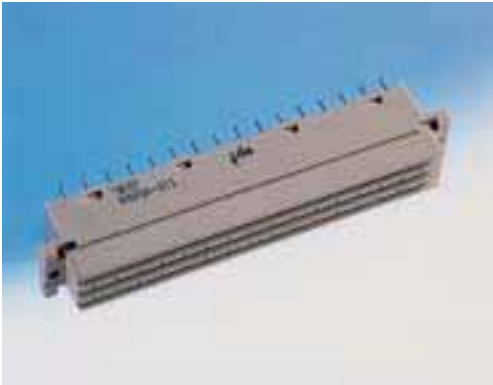


Male Connectors Type F

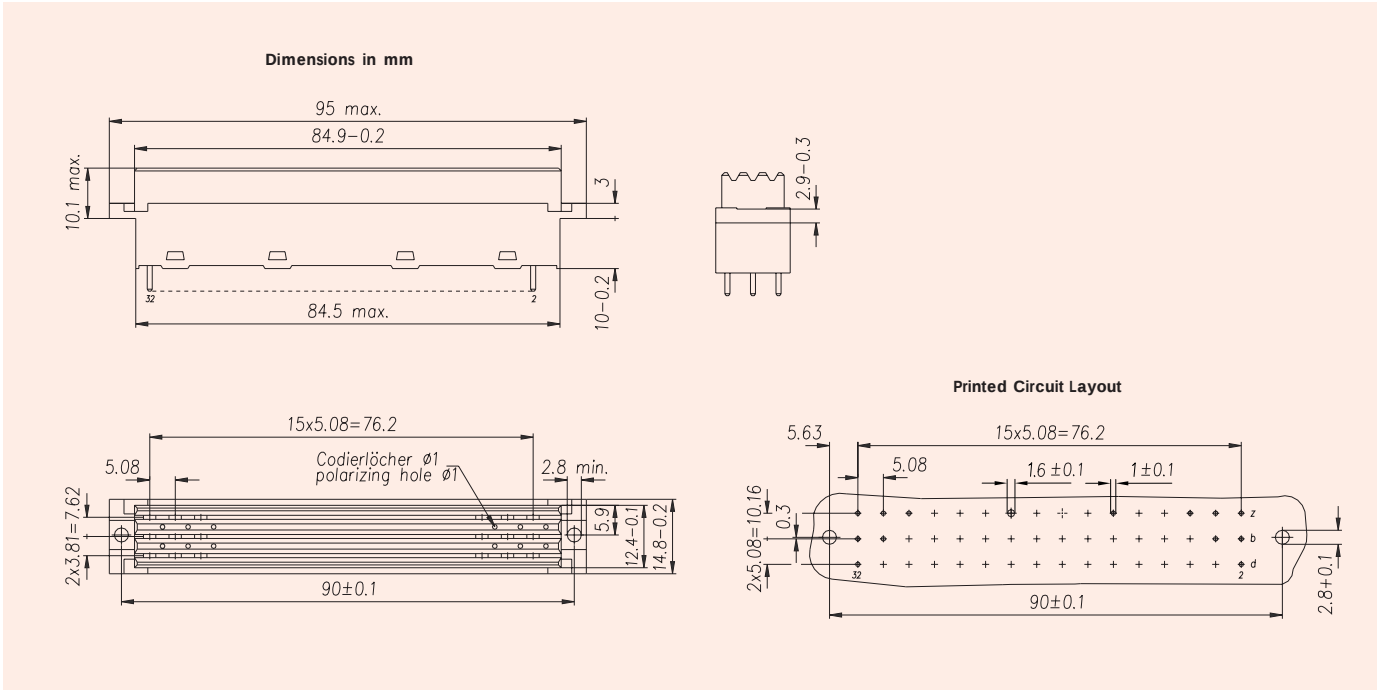


No. of Positions		32	32	48
Position		Row b, z	Row d, z	Row d, b, z
Termination Methods	Quality Class	Part Numbers		
	II	109-40024	109-40014	109-40064
	II	109-40025	109-40015	109-40065

On request: Premating contact 1,3 mm — other quality class — THTR- technology available



Female Connectors Type F

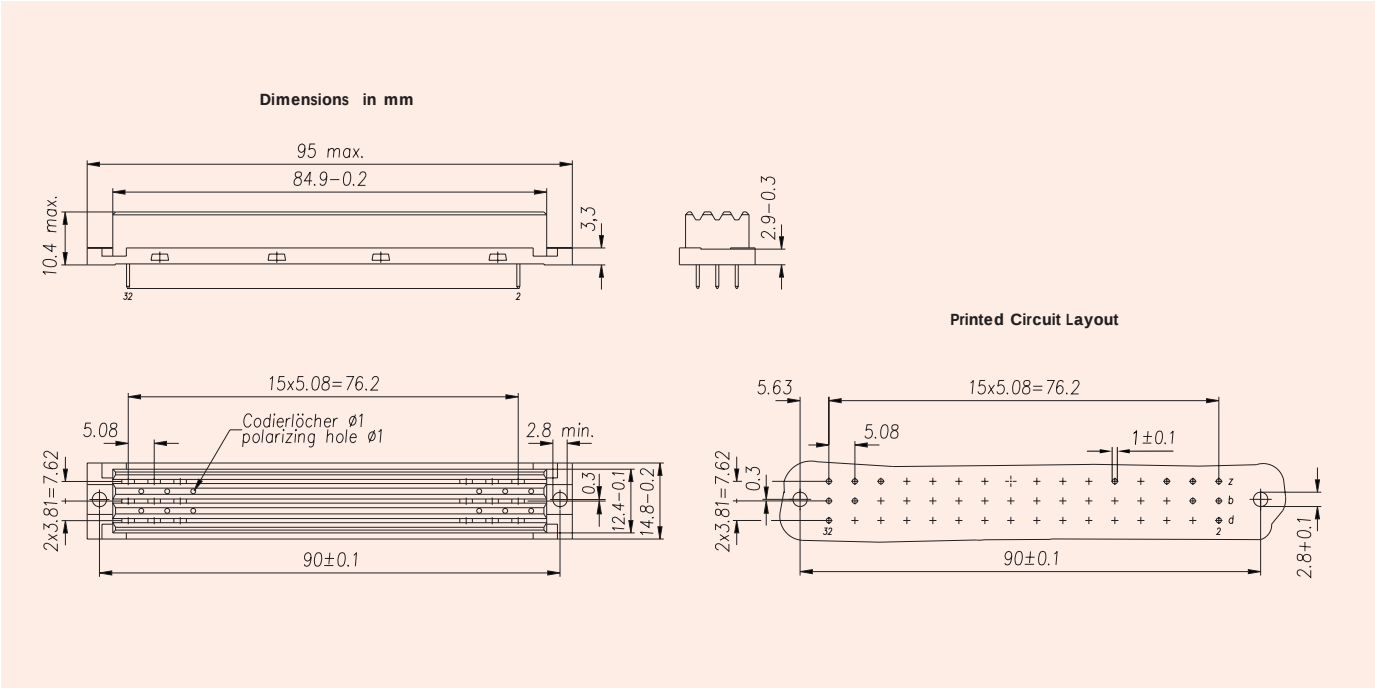


No. of Positions		32	32	48
Position		Row b, z	Row d, z	Row d, b, z
Termination Methods	Quality Class	Part Numbers		
	II	110-40025	110-40015	110-40065
	II	110-40024	110-40014	110-40064
	II	110-40005	110-40004	110-40084
hand soldering connection 	II	110-40046	110-40036	110-40076

On request: Special assembly possible — Coding pin (page 1.17) — other quality class — THTR- technology available

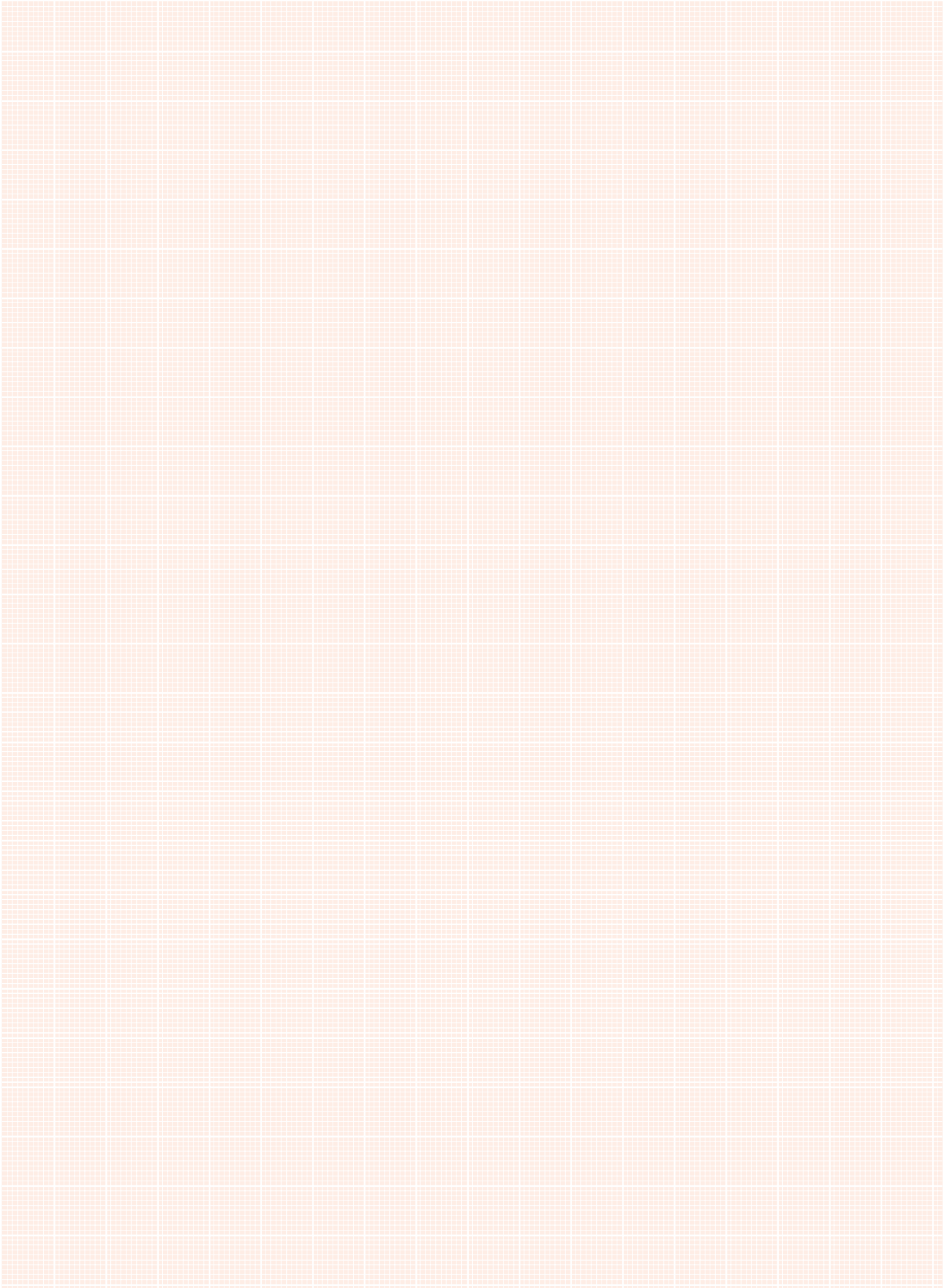


Female Connectors Type F low profile



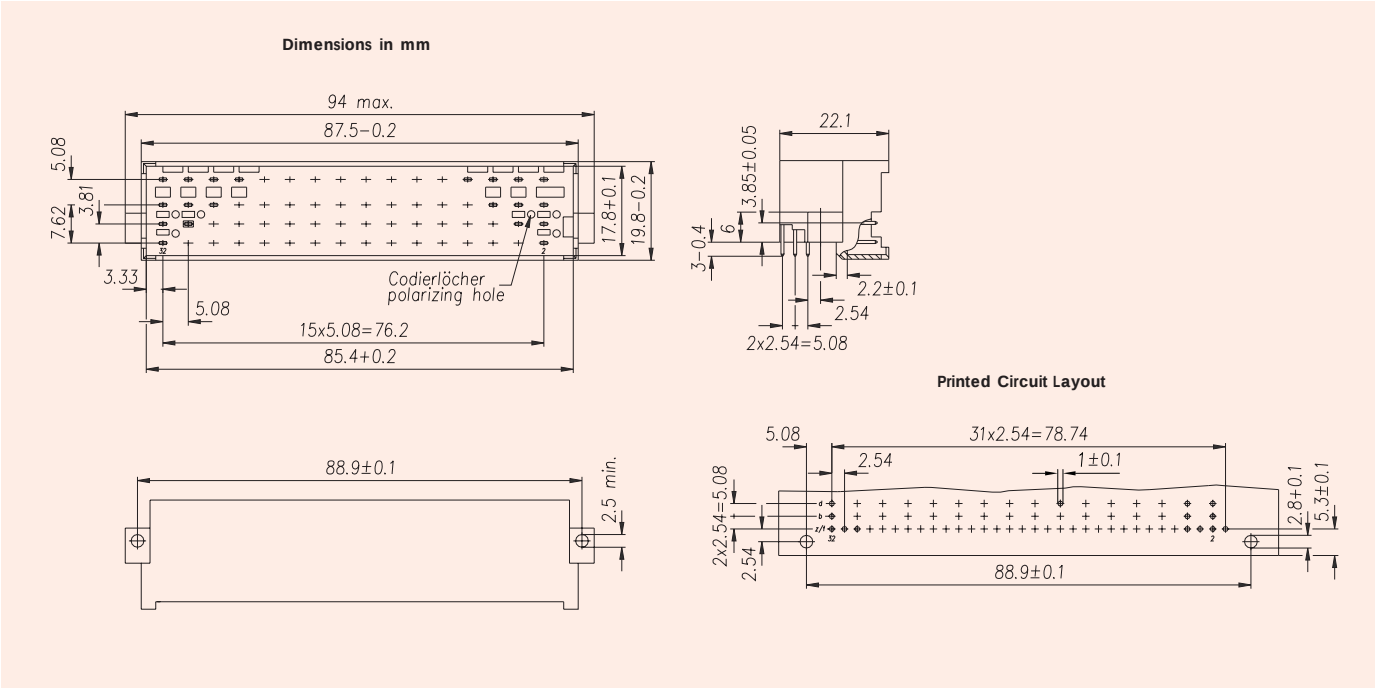
No. of Positions		32	32	48
Position		Row b, z	Row d, z	Row d, b, z
Termination Methods	Quality Class	Part Numbers		
	II	110-40505	110-40504	110-40584

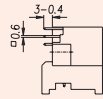
On request: with/without mounting flange — Coding pin (page 1.17) — other quality class — THTR- technology available





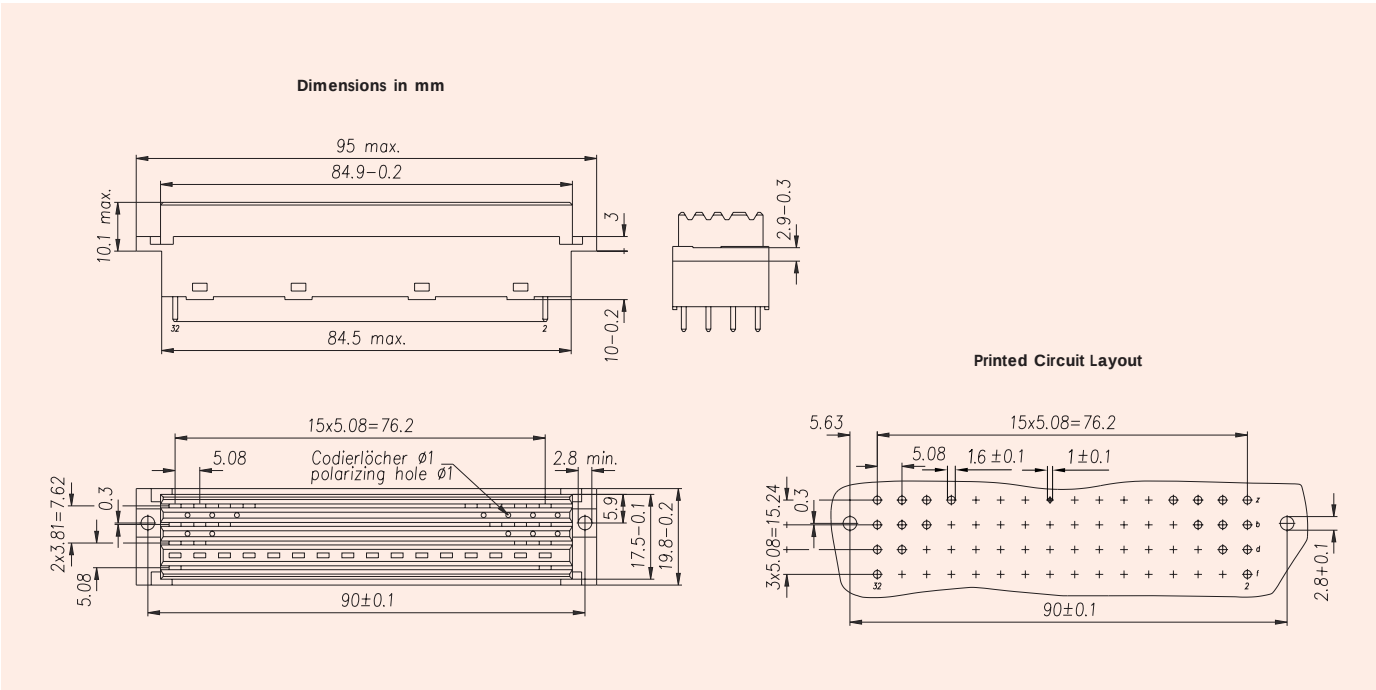
Male Connectors Type G

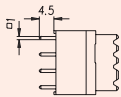
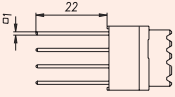
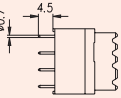
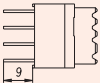


No. of Positions		64	64	64
Premating Contact on Position			Z 2	Z 2 and Z 32
Termination Methods	Quality Class	Part Numbers		
	II	111-40064	111-40164	111-40264



Female Connectors Type G

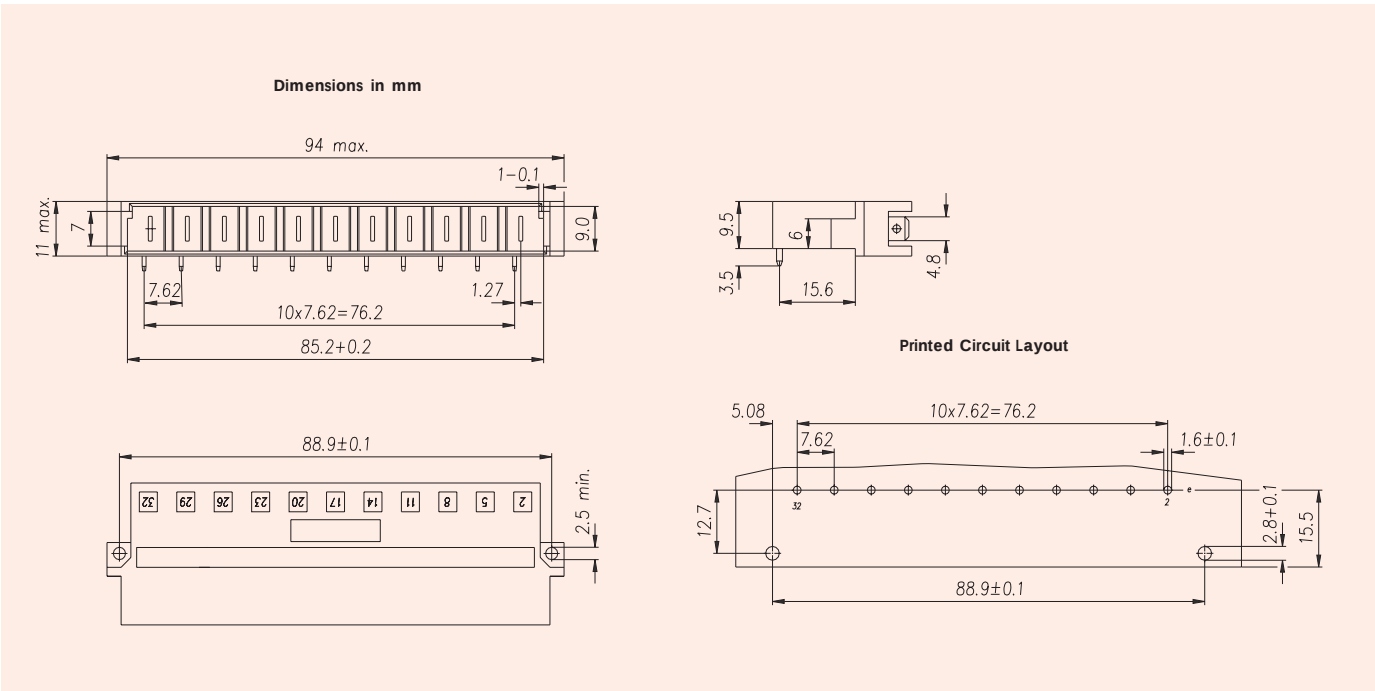


No. of Positions		64
Position		Row z, b, d, f
Termination Methods	Quality Class	Part Numbers
	II	112-40064
	II	112-40065
	II	112-40084
hand soldering connections 	II	112-40095

On request: Coding pin (page 1.17)



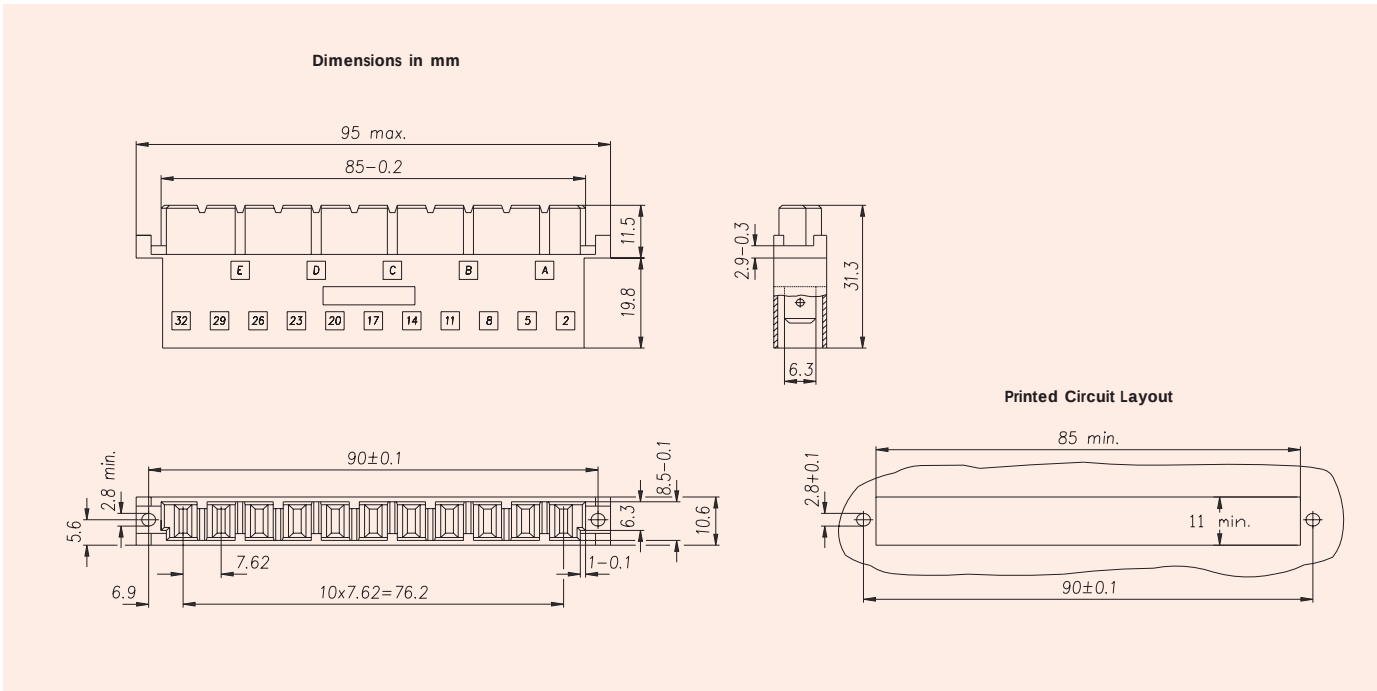
Male Connectors Type H11



No. of Positions		11	10+1	9+2
Premating Contact on Position			32	2 and 32
Termination Methods	Plating	Part Numbers		
	silver plated	113-40010	113-40015	113-40020
	silver plated	113-40030	113-40035	113-40040



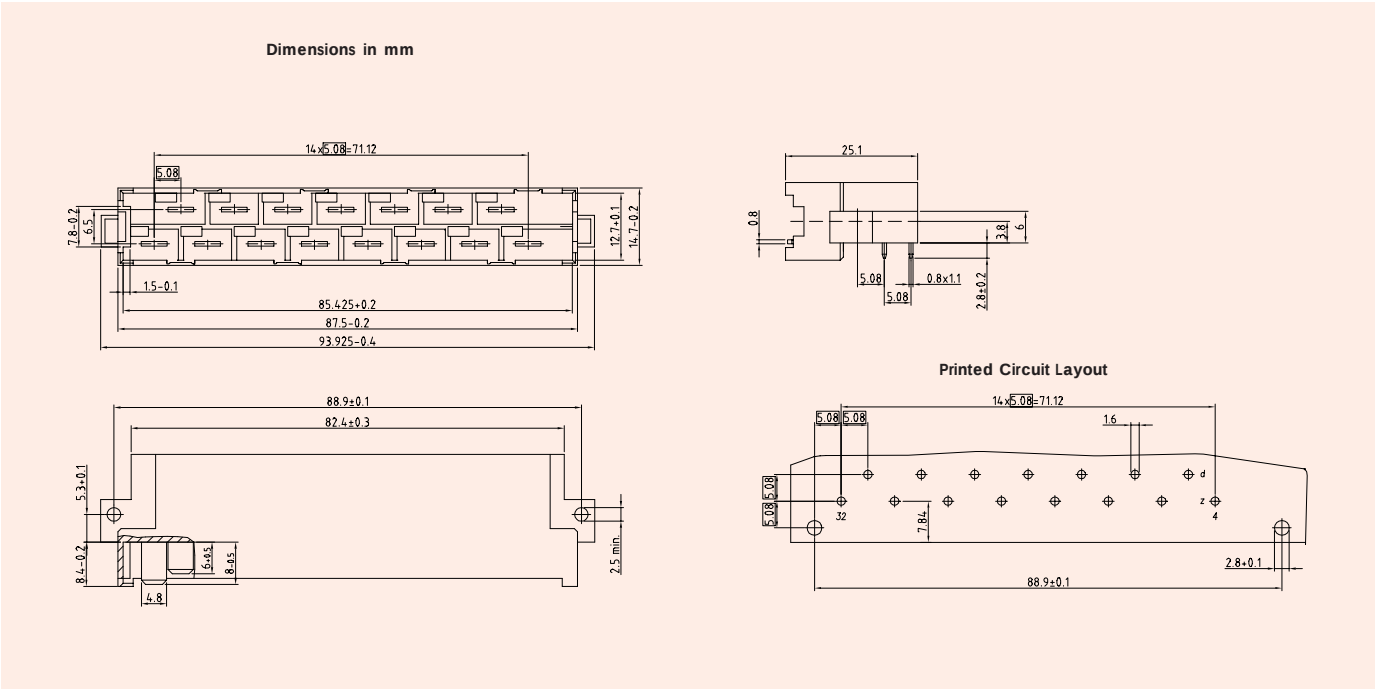
Female Connectors Type H11



No. of Positions		11
Termination Methods	Plating	Part Numbers
	silver plated	114-40040
Possibility of Coding		
	Keying plug	114-30000



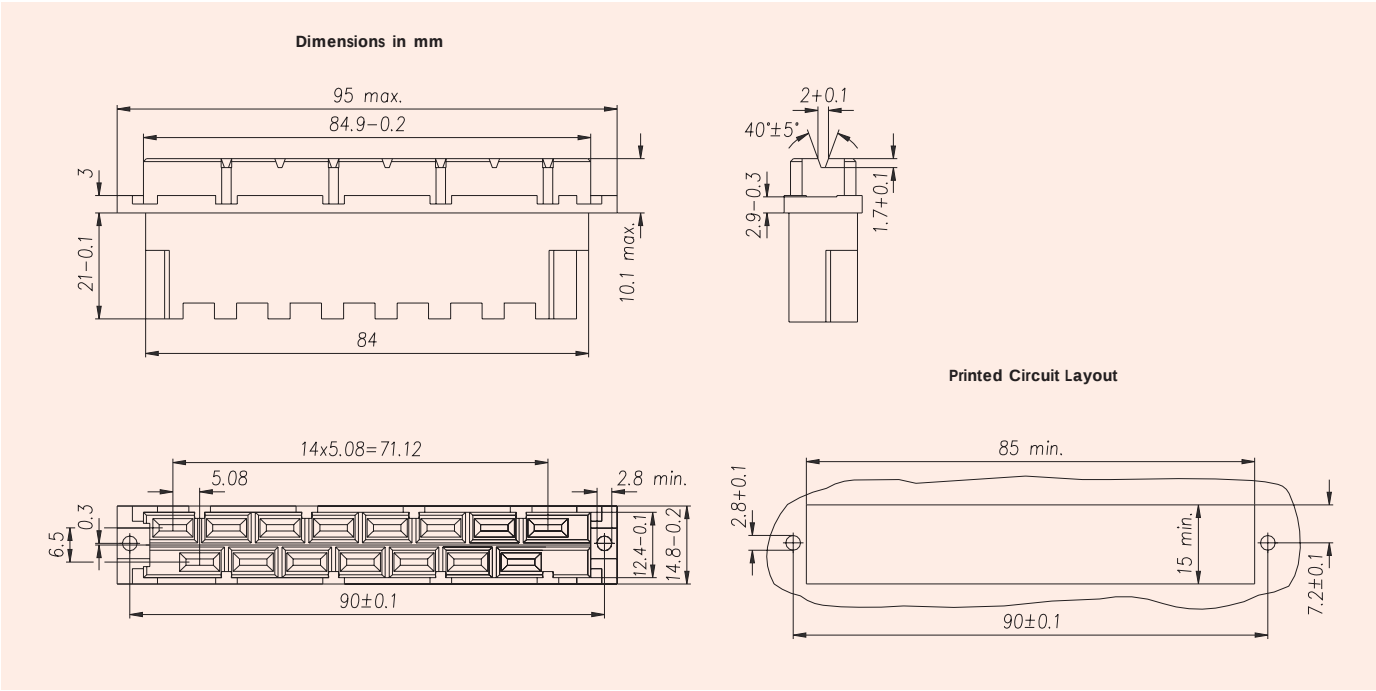
Male Connectors Type H15



No. of Positions		15	15
Premating Contact on Position		Z 32	Z 4 and Z 32
Termination Methods	Plating	Part Numbers	
	silver plated	113-40060	113-40160
	silver plated	113-40070	113-40075



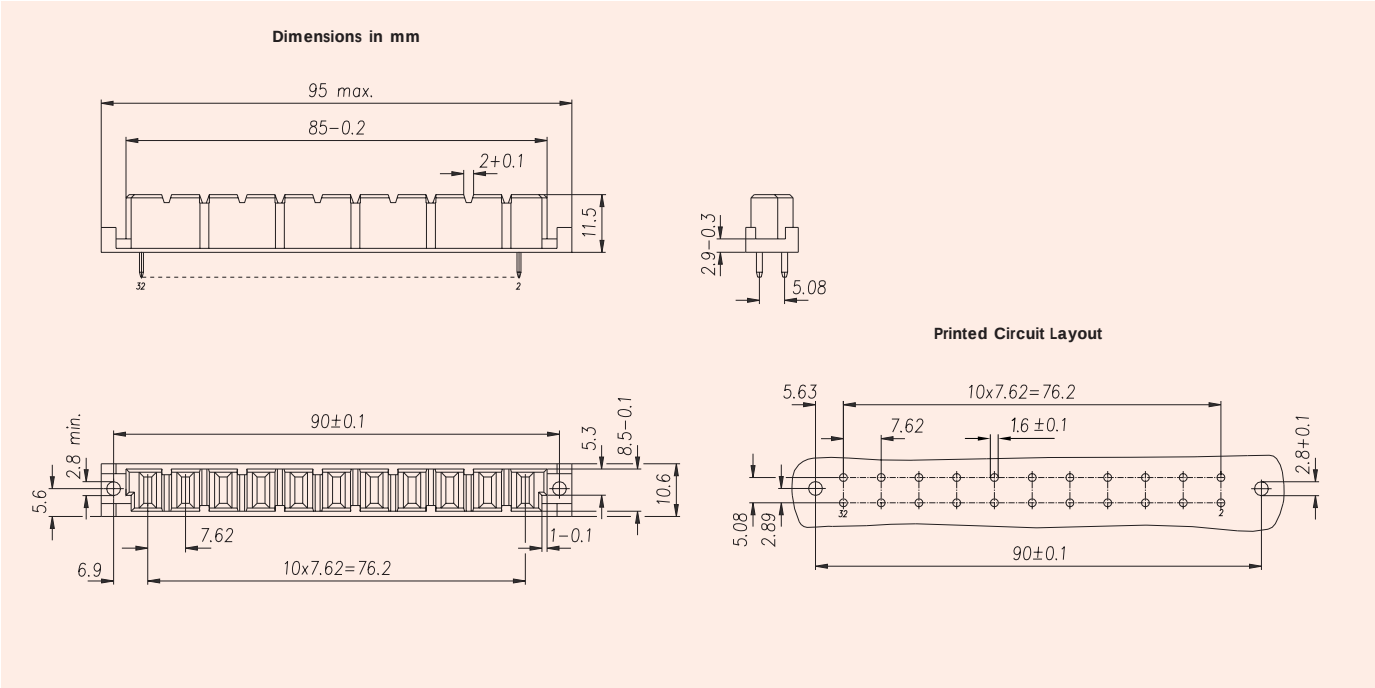
Female Connectors Type H15



No. of Positions		15
Position		Row d, z
Termination Methods	Plating	Part Numbers
	silver plated	114-40060
	silver plated	114-40070



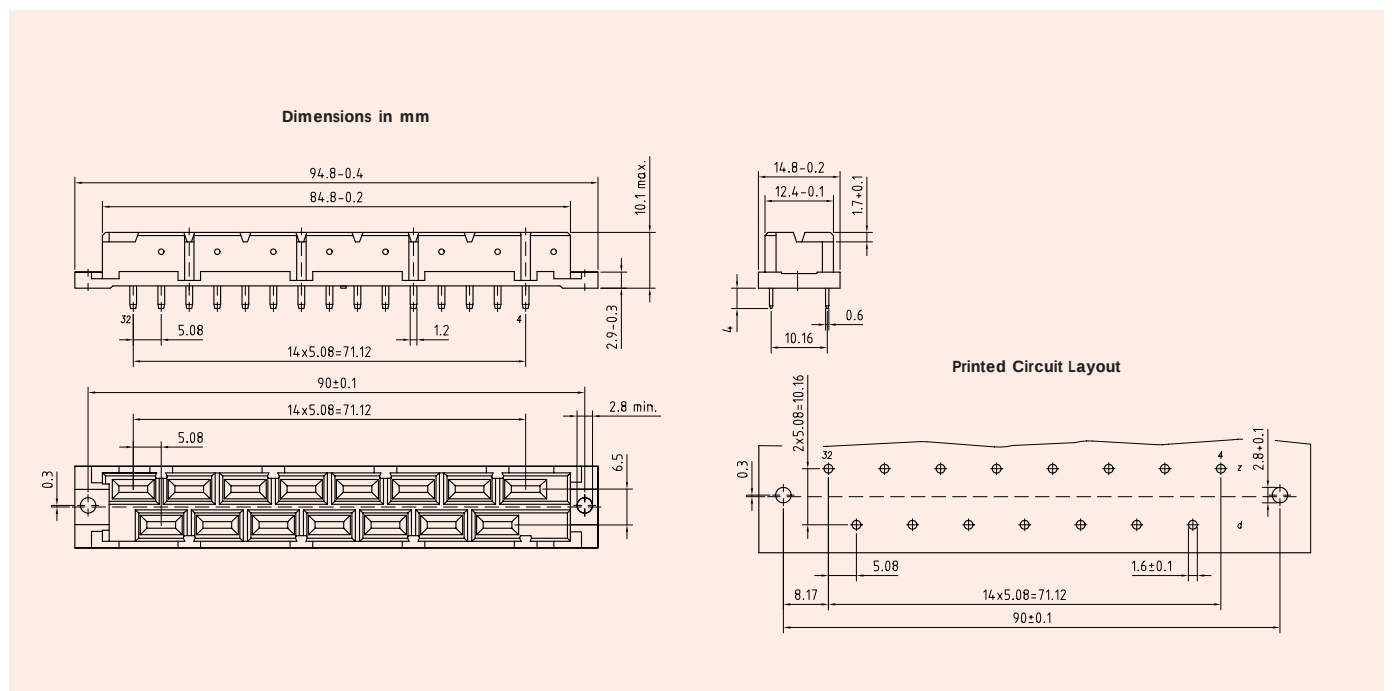
Female Connectors Type H11 low profile



No. of Positions		11
Termination Methods	Plating	Part Numbers
	silver plated	114-40050
Possibility of Coding		
	Keying plug	114-30000

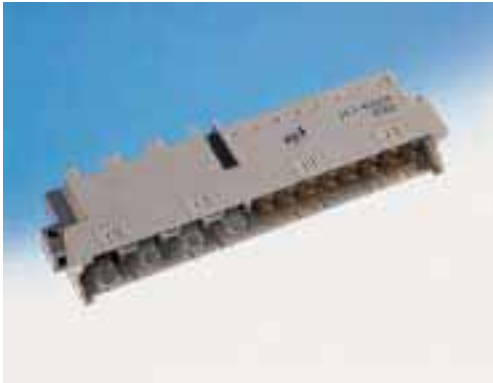


Female Connectors Type H15 low profile

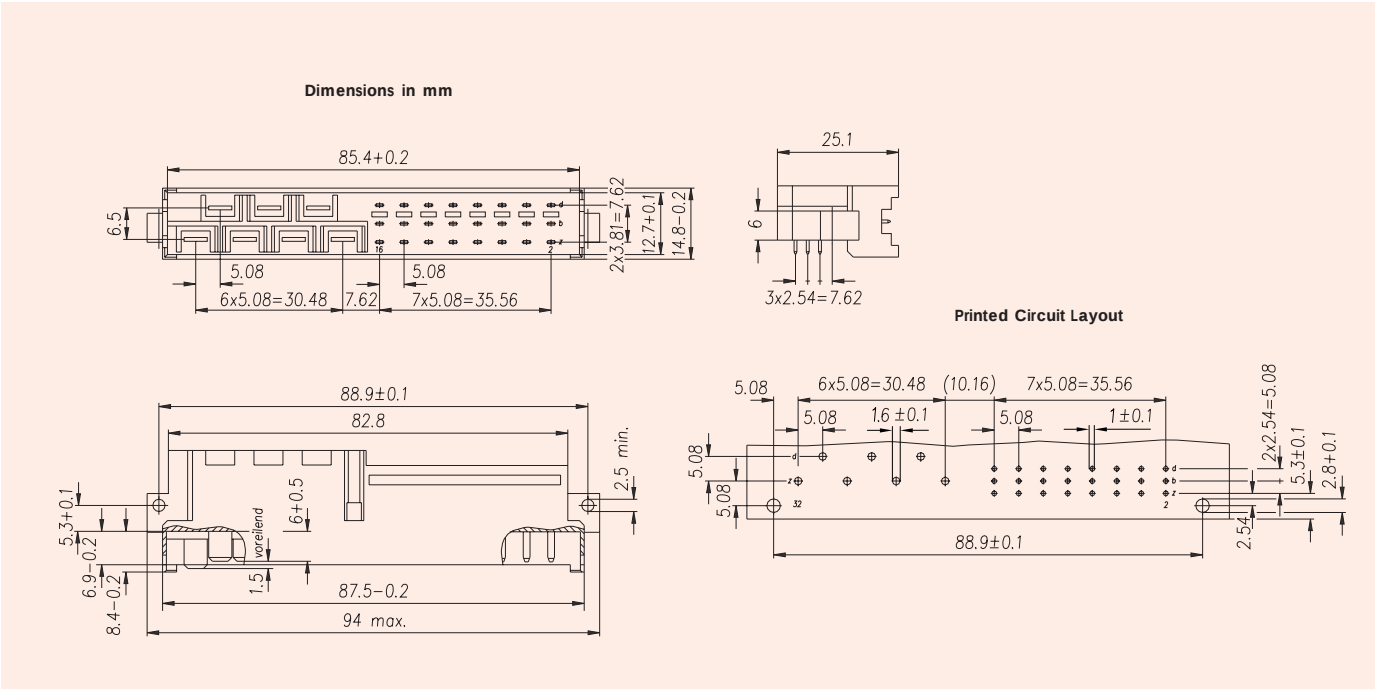


No. of Positions		15
Positions		Row d, z
Termination Methods	Plating	Part Numbers
	silver plated	114-40080
	silver plated	114-40090
	silver plated	114-40100

Possibility of Coding see page 4.28



Male Connectors Type H7/F24 mixed pin

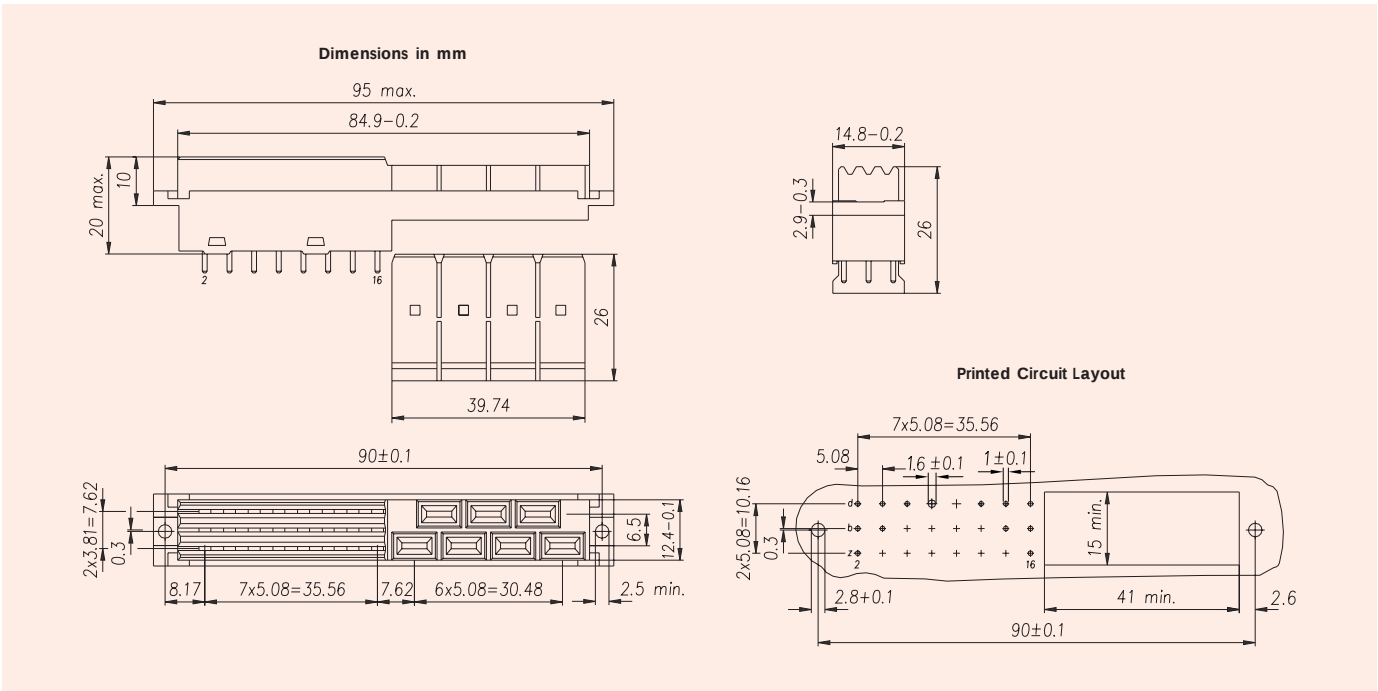


No. of Positions		7+24
Position		Row d, b, z
Termination Methods	Quality Class	Part Numbers
	II	117-40064
	II	117-40065

H-male contacts are silver plated
On request: Premating contact 1,5 mm



Female Connectors Type H7/F24 mixed pin

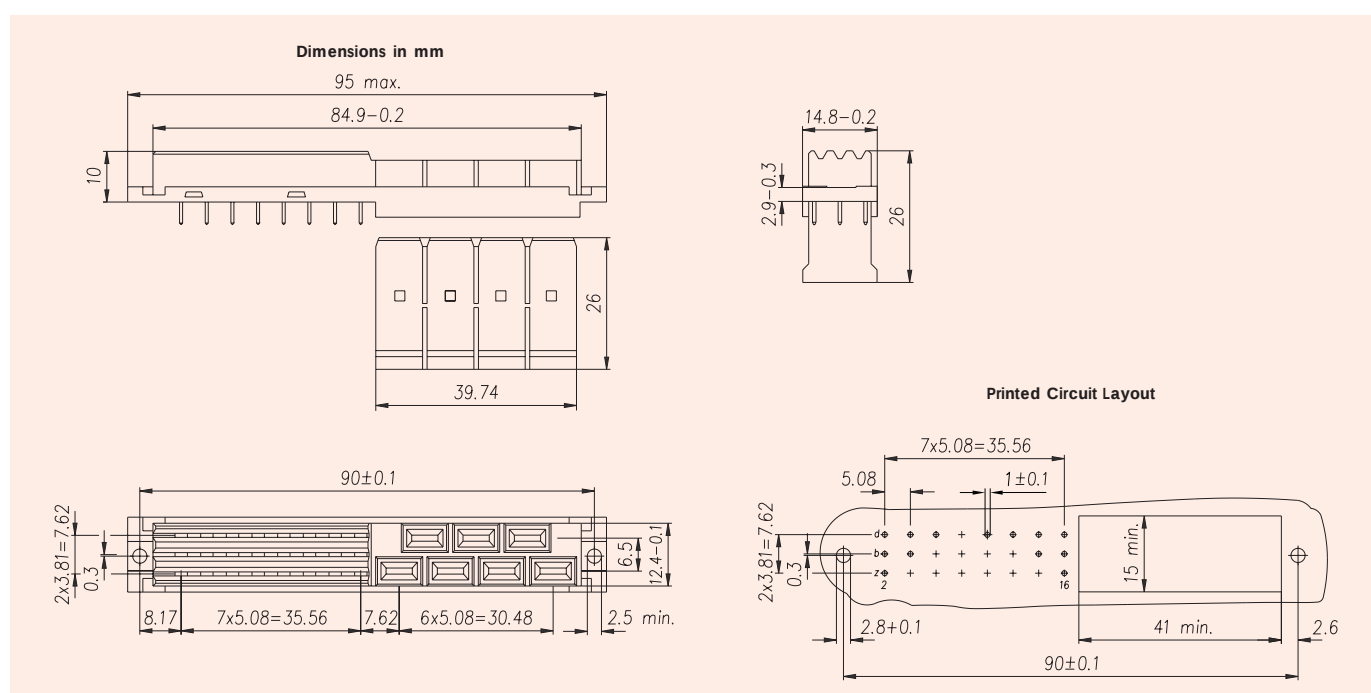


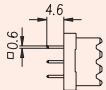
No. of Positions		16	16	24
Position		Row b, z	Row d, z	Row d, b, z
Termination Methods	Quality Class	Part Numbers		
	II	118-40025	118-40015	118-40065
	II	118-40024	118-40014	118-40064
	II	118-40005	118-40004	118-40084

Please order the crimp-contacts separately (page 4.32)



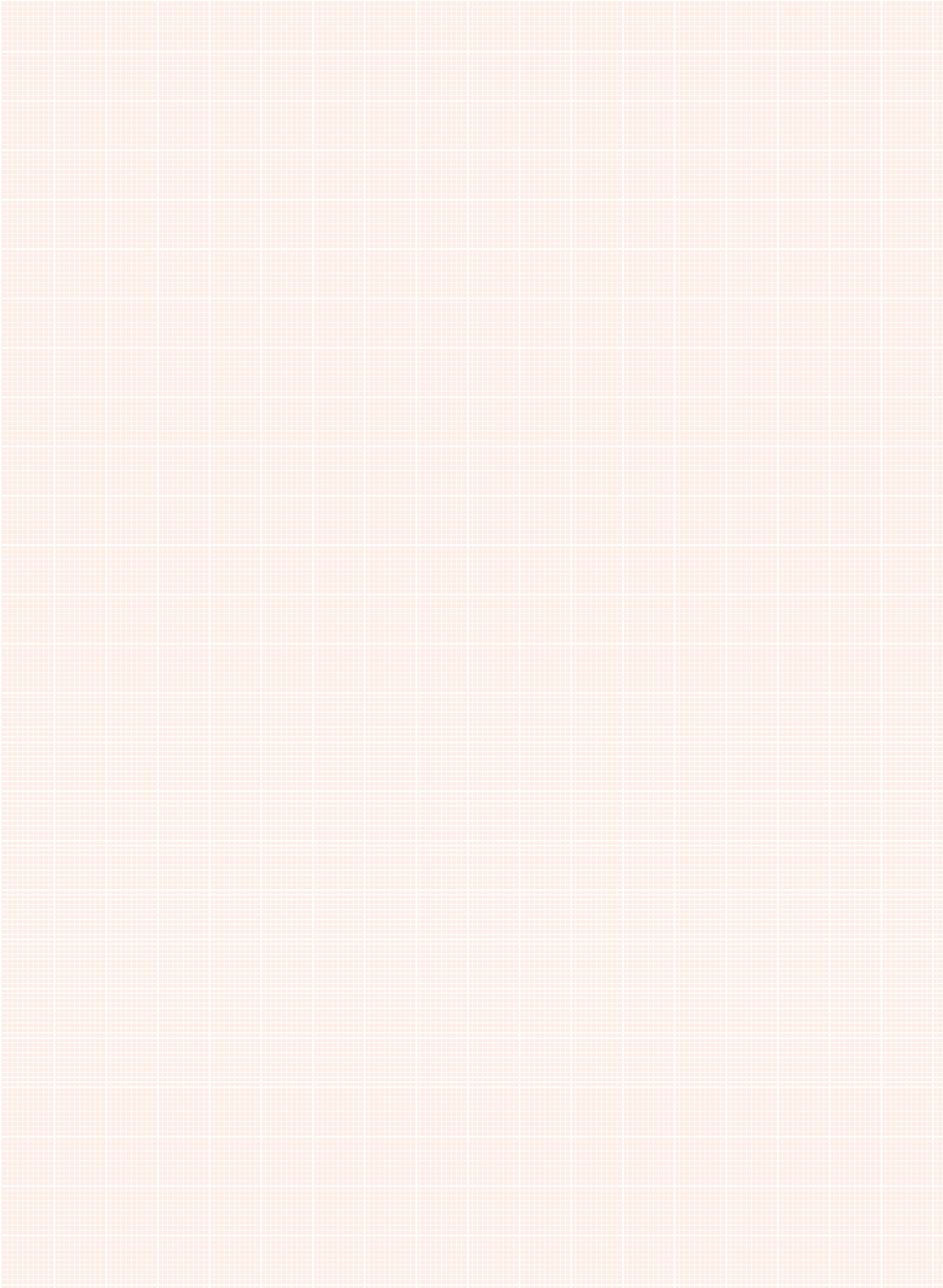
Female Connectors Type H7/F24 low profile mixed pin

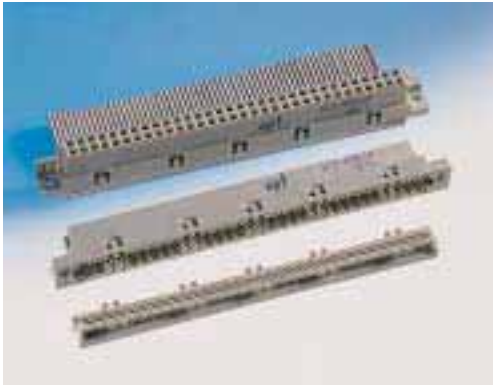


No. of Positions		7+16	7+16	7+24
Position		Row b, z	Row d, z	Row d, b, z
Termination Methods	Quality Class	Part Numbers		
	I	118-40508	118-40507	118-50587
	II	118-40505	118-40504	118-40584
	III	118-40502	118-40501	118-40581

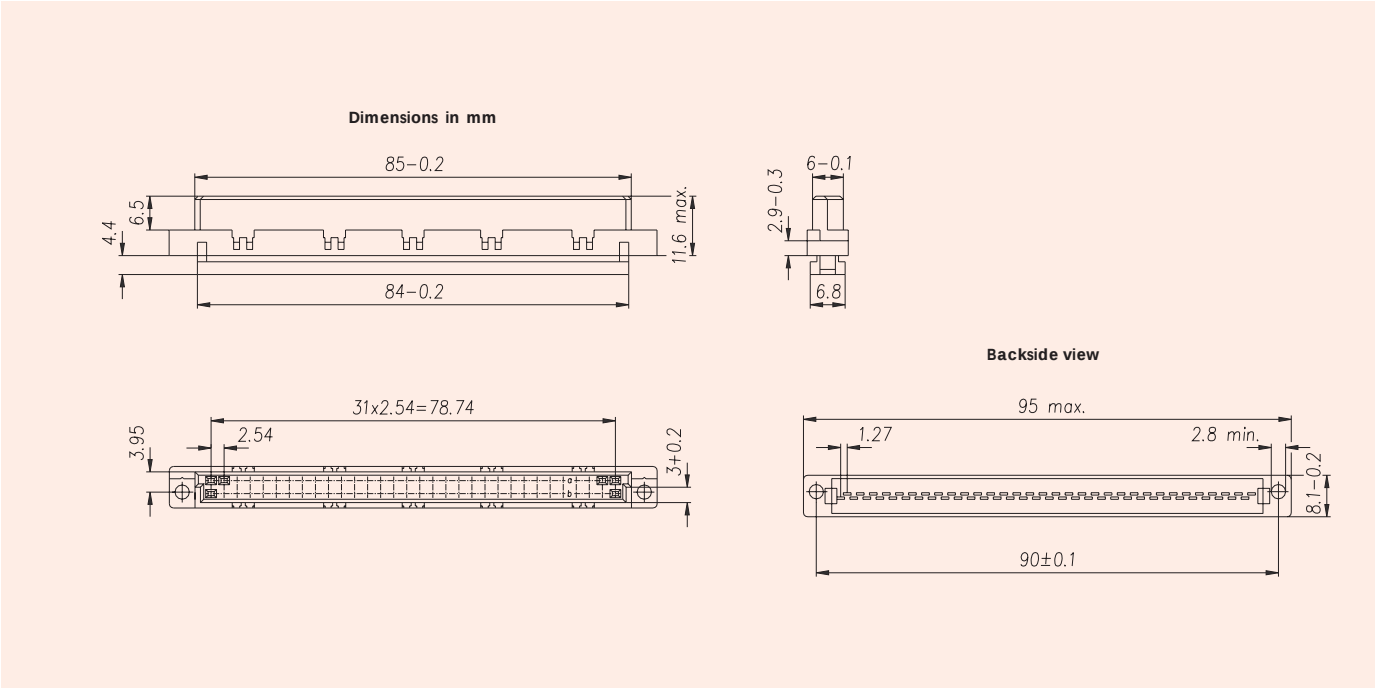
Crimp-Contacts for H7 Power Terminal

Cross section (mm²)	Packing Unit	Part Numbers
1,5 - 2,5	250	118-21062
0,5 - 1,0	250	118-21063
2,5 - 4,0	250	118-21064





Female IDC Connectors Type B



No. of Positions		64
Type	Quality Class	Part Number
B-Female connector	I	—
	II	102-49064
	III	—

Specifications

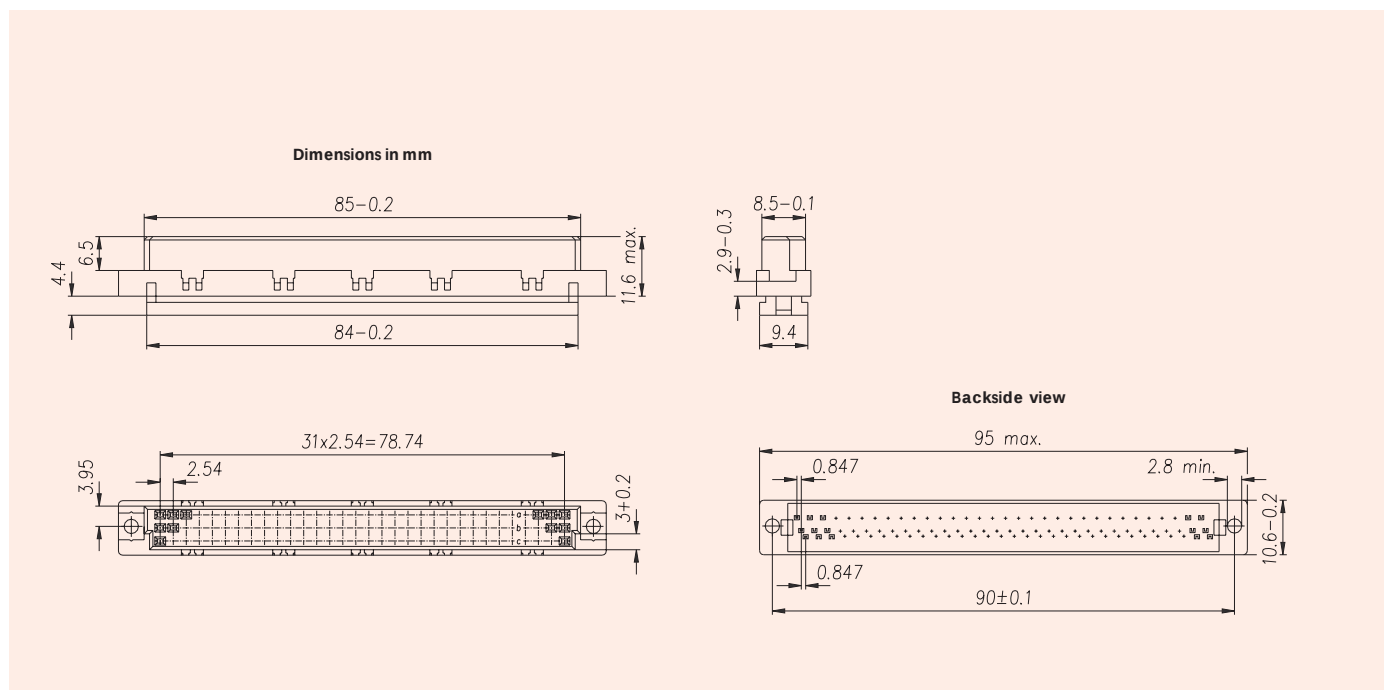
Contact	CuSn, Au over Ni	Operating Current	1 A at 20° C
Terminals	IDC	Operating Voltage	220 V, 50 Hz
Housing	Polyester, self extinguishing att. UL 94 V0	Test Voltage	500 V / 1,27 mm ; 350 V/ 0,84 mm
Temperature Range	-55 °C to +125 °C	Contact Resistance	≤ 30 mΩ
Mating Cycles	Quality Class I...II...III = 500...400...50	Insulation Resistance	≥ 10 ⁹ Ω
		Capacitance	0,5 - 1 pF

IDC Connector

DIN 41612



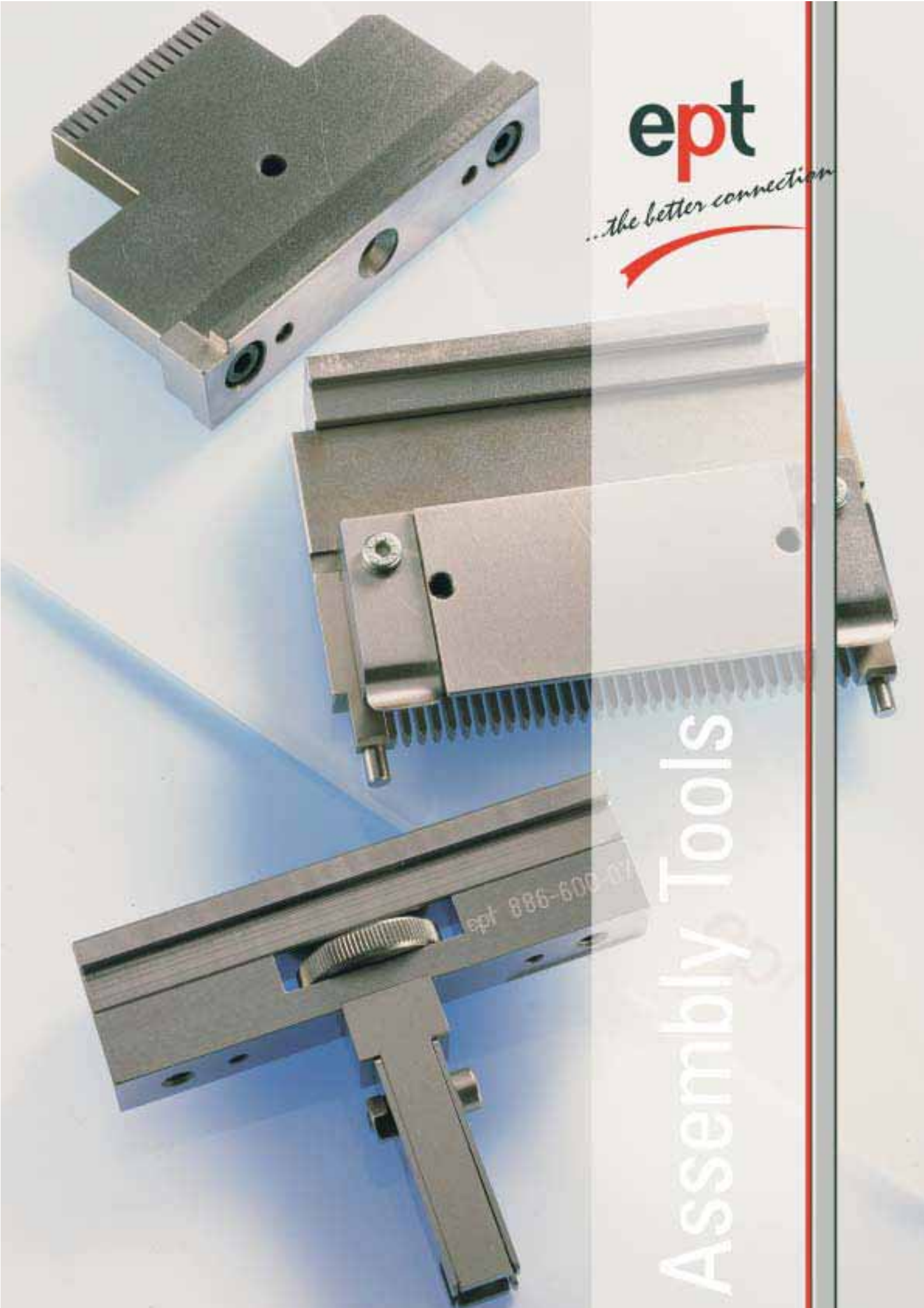
Female IDC Connectors Type C



No. of Positions		64	96
Type	Quality Class	Part Numbers	
C-Female connector	I	104-49057	104-49067
	II	104-49054	104-49064
	III	—	—
Flat Cable	AWG 28	—	104-19002

Specifications

Contact	CuSn, Au over Ni	Operating Current	1 A at 20° C
Terminals	IDC	Operating Voltage	220 V, 50 Hz
Housing	Polyester, self extinguishing att. UL 94 V0	Test Voltage	500 V / 1,27 mm ; 350 V / 0,84 mm
Temperature Range	-55 °C to +125 °C	Contact Resistance	≤ 30 mΩ
Mating Cycles	Quality Class I...II...III = 500...400...50	Insulation Resistance	≥ 10 ⁹ Ω
		Capacitance	0,5 - 1 pF



The image displays three precision-machined metal assembly tools. The top tool is a cross-shaped block with a central square hole and four circular holes on its arms. The middle tool is a sliding clamp with a central block and a threaded rod. The bottom tool is a T-shaped clamp with a central block and a threaded rod. The tools are arranged diagonally across the frame.

ept

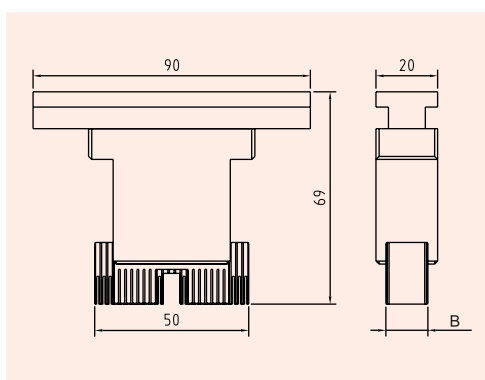
...the better connection

Assembly Tools

ept 886-600-07

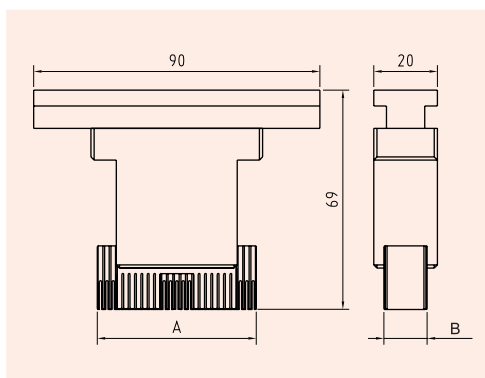
Insertion Tools for ept-hm 2.0 Connectors

Male Connectors Type A, D



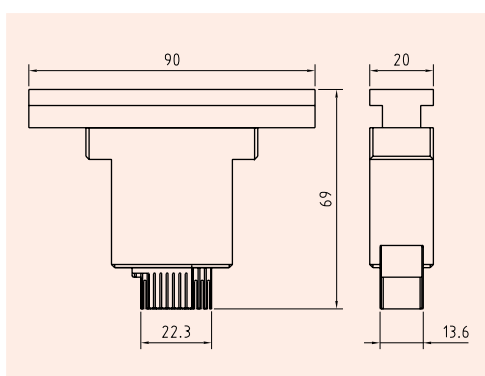
Type	Part Numbers	A/B (mm)
A	884-700-W25	-/13,6
D	884-710-W25	-/19,6

Male Connectors Type B, B-22, B-19, E



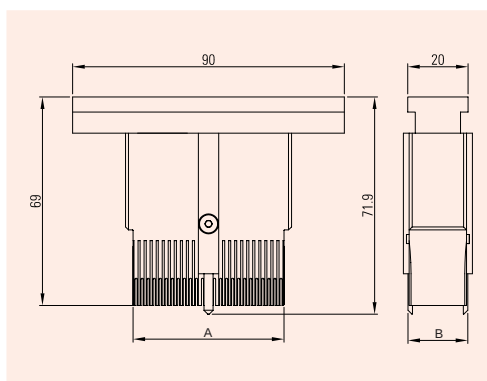
Type	Part Numbers	A/B (mm)
B	884-701-W25	50/13,6
B-22	884-701-W22	44/13,6
B-19	884-701-W19	38/13,6
E	884-711-W25	50/19,6

Male Connectors Type C, F



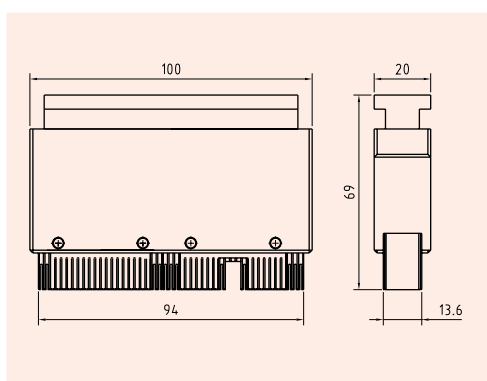
Type	Part Numbers	A/B (mm)
C	884-702-W11	13,6/-
F	884-713-W11	19,6/-

Male Connectors Type AB-19, AB-22, AB-25, DE-25



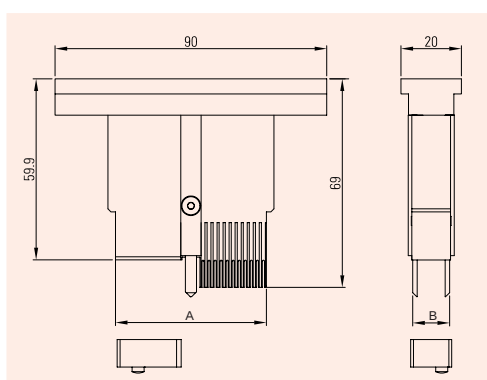
Type	Part Numbers	A/B (mm)
AB-19	884-708-W19	38/13,6
AB-22	884-708-W22	44/13,6
AB-25	884-708-W25	50/13,6
DE-25	884-712-W25	50/19,6

Male Connectors Type Compact PCI



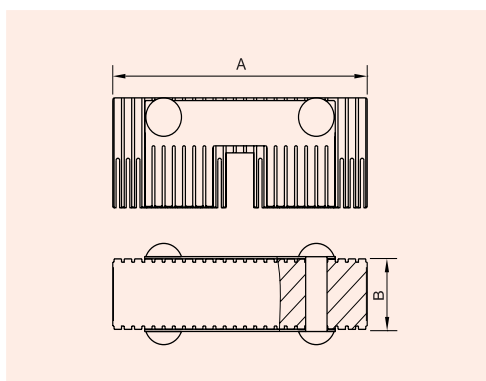
Type	Part Numbers	A/B (mm)
C-PCI	884-703-W147	—

Male Connectors Type L, M, N



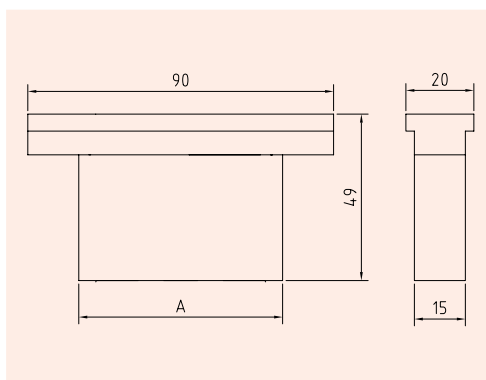
Type	Part Numbers	A/B (mm)
L	884-707-W1	50/12,2
M	884-707-W2	50/12,2
N	884-707-W3	21,2/12,8

Flat Rock Tool for hm 2.0 Male Connectors



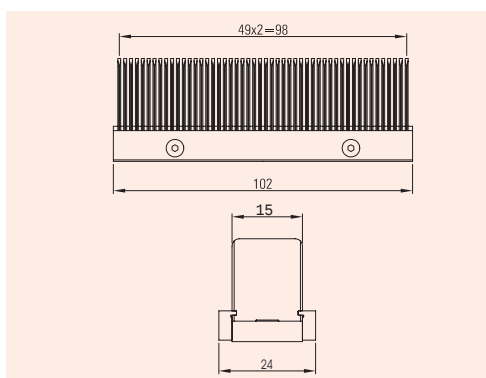
Type	Part Numbers	A/B (mm)
A	884-700-W125	50/13,6
B	884-701-W125	50/13,6
B-22	884-701-W122	44/13,6
B-19	884-701-W119	38/13,6
C	884-702-W111	25/13,6
C-PCI	884-703-W147	94/13,6
D	884-710-W125	50/19,6
E	884-711-W125	50/19,6
F	884-713-W111	25/19,6

Flat Rock Press-fit Tool



Type	Part Numbers	A/B (mm)
ML-ABC	884-705	60/-
ML-cPCI	884-706	94/-
FL-AB	884-720-W25	50/-
FL-B22	884-720-W22	44/-
FL-B19	884-720-W19	38/-
FL-C	884-720-W11	25/-
FL-cPCI	884-720-W47	94/-

Support Block

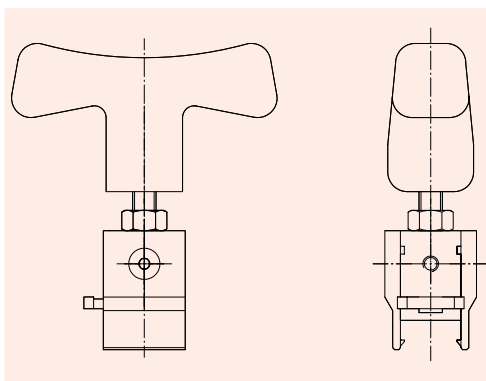


Type	Part Numbers	A/B (mm)
Univers	890-705-W50	—

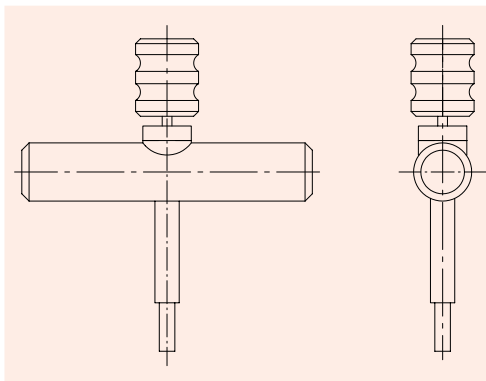
Mounting and repair set for connector system hm 2.0

Part Number **892-705-W1**

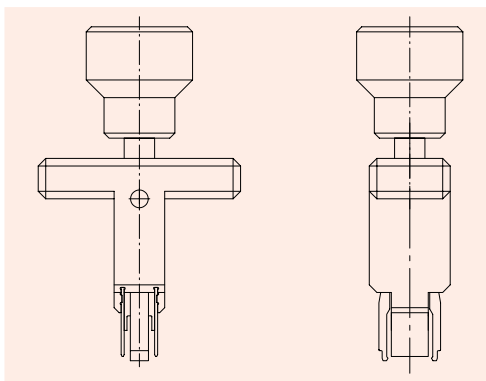
Shroud Equipping and Stripping Tool



Single Pin Extraction and Set Tool

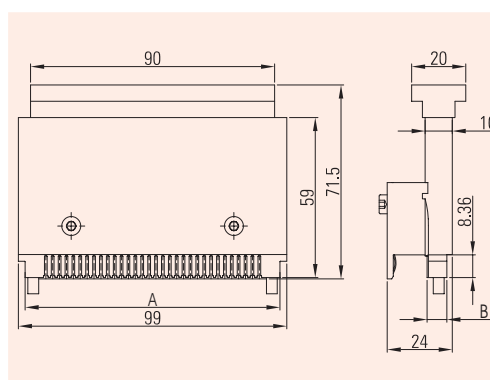


Coding Key Set Tool



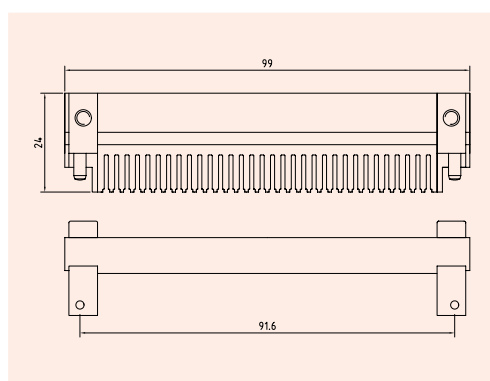
Insertion Tool for ept-Connectors

Male Connectors Type B, C



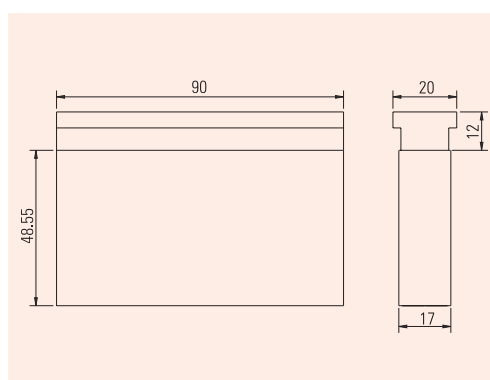
Type	Part Numbers	A/B (mm)
B	884-150	94/5,5
B/2	884-151	53,4/5,5
B/3	884-152	38/5,5
C	884-250	94/8,5
C/2	884-251	53,4/8,5
C/3	884-252	38/8,5

Male Connectors Type C, Flat Rock



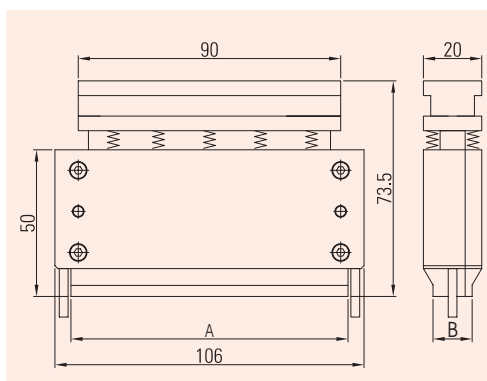
Type	Part Numbers	A/B (mm)
C	884-260	—
C/2	884-261	—
C/3	884-262	—

Female Connectors Type B-, C-Flat Rock, PC/104



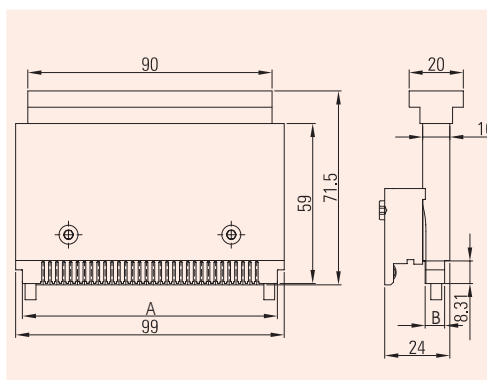
Type	Part Numbers	A/B (mm)
flach	886-900-W1	—
PC/104+	886-900-W3	—

Female Connectors Type B, C, D, E, F, G



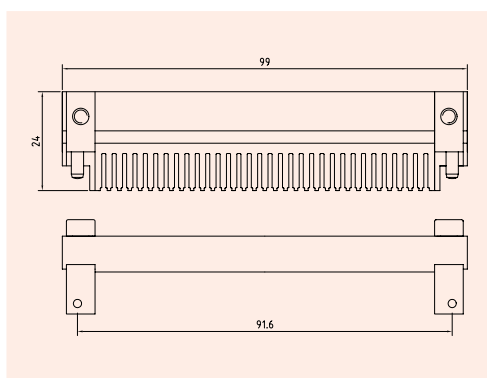
Type	Part Numbers	A/B (mm)
B	884-100	95/11
B/2	884-101	54/11
B/3	884-102	39/11
C	884-200	95/13,5
C/2	884-201	54/13,5
C/3	884-202	39/13,5
D	884-303	95/13,5
E	884-353	95/18,6
F	884-401	95/17,5
F-flat	884-406	95/17,5
G	884-453	95/22,6
G-flat	884-451	95/22,6

Female Connectors Type R



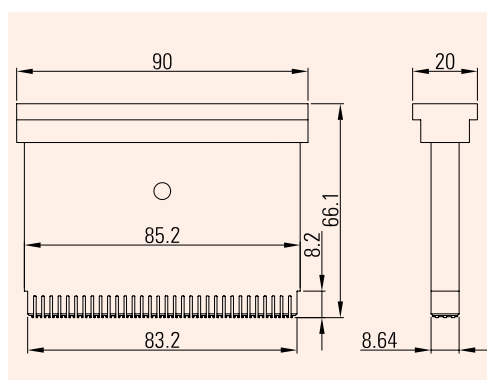
Type	Part Numbers	A/B (mm)
R	884-500	94/7,2
R/2	884-501	55/7,2

Female Connectors Type R Flat Rock



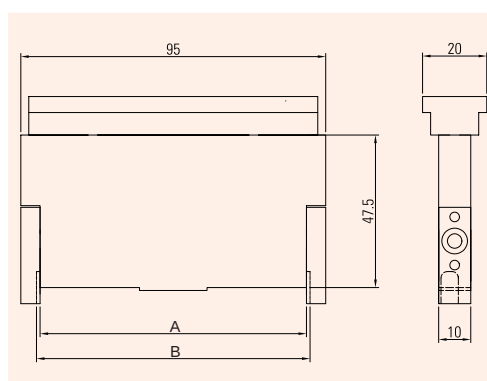
Type	Part Numbers	A/B (mm)
R	884-503	—
R/2	884-502	—

Male Connectors Type R



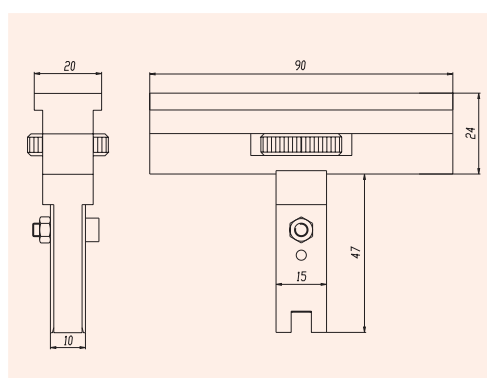
Type	Part Numbers	A/B (mm)
R	884-525	83/8,6
R/2	884-526	42,5/8,6
R/3	884-527	27,3/8,6

Female Connectors Type M



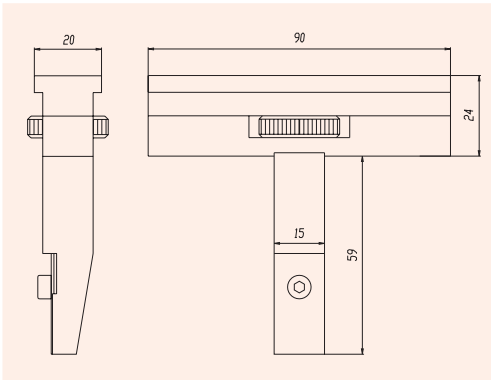
Type	Part Numbers	A/B (mm)
M6+10	884-540-W6	83/85,2
M24+8	884-540-W24	83/85,2
M42+6	884-540-W42	83/85,2
M60+4	884-540-W60	83/85,2
M78+2	884-540-W78	83/85,2
M/2	884-541	42,4/44,6
M/3	884-542	27,1/29,3

Power Terminals



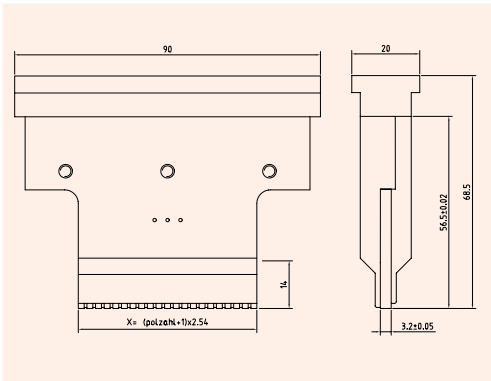
Type	Part Numbers	A/B (mm)
910	886-600	—
911320	886-601-1	—
911322	886-604	—

Spade Terminals



Type	Part Numbers	A/B (mm)
090	884-650	—

VarPol Headers



Straight:

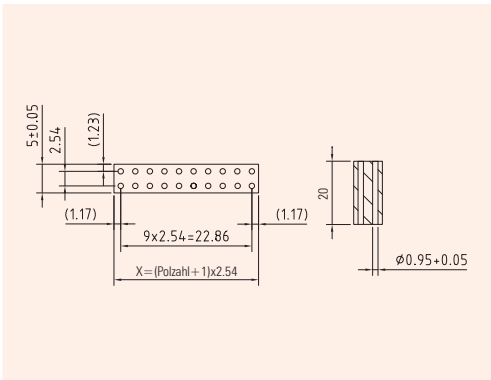
Type	Part Numbers	Pin length
1-row	886-461-xx	5 < Y < 25
2-row	886-462-xx	5 < Y < 25
3-row	886-463-xx	5 < Y < 25

Right angles:

Type	Part Numbers	Pin length
1-row	886-471-xx	5 < Y < 25
2-row	886-472-xx	5 < Y < 25
3-row	886-473-xx	5 < Y < 25

xx = no. of positions per row (max. 54)

VarPol Straight Headers Flat Rock

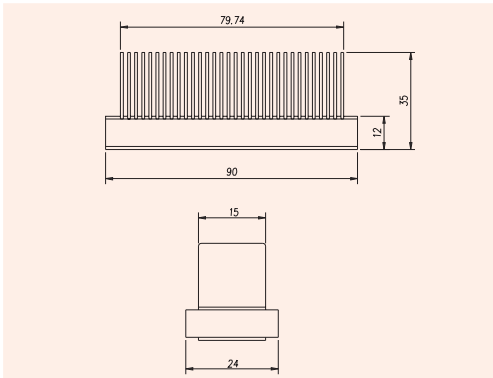


Type	Part Numbers	Pin length
2-row	886-466-xx	Y < 20
3-row	886-467-xx	Y < 20

Flat rock insertion tool on request

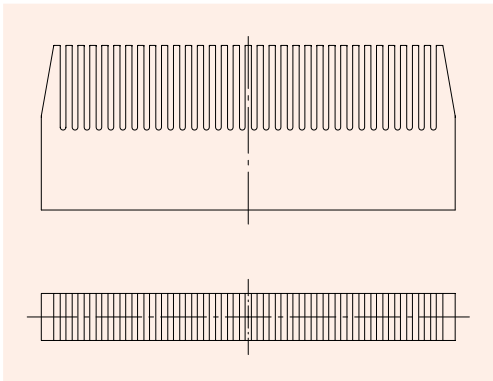
Support Tool for ept-Connectors

Support Block



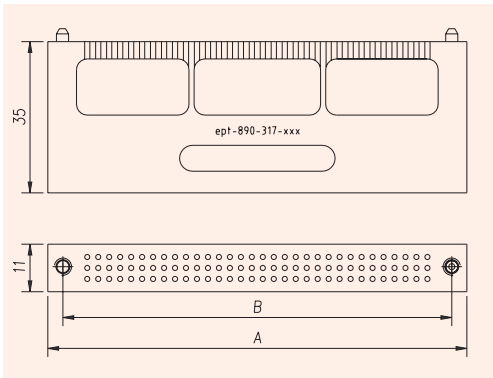
Type	Part Numbers	A/B (mm)
BUS	890-100-W1	—
H7/F24	890-102	—
F-flach	890-101	—

Universal Support Block



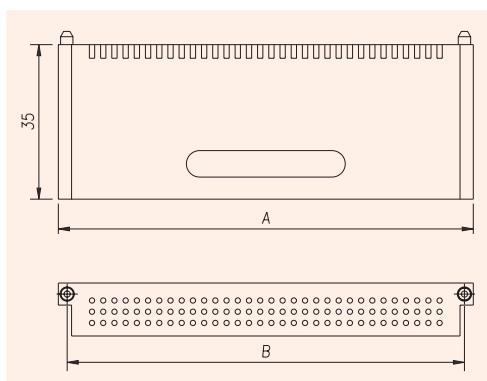
Type	Part Numbers	A/B (mm)
Univers	890-100-W10	—

B-, C-Female, R-Male Connectors



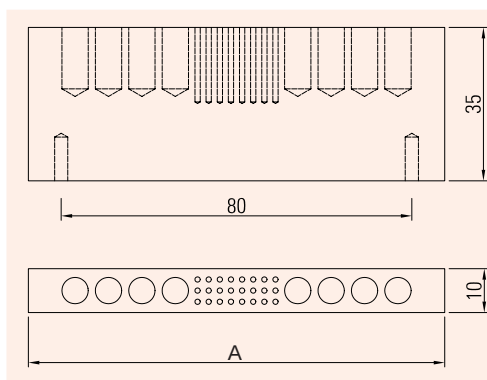
Type	Part Numbers	A/B (mm)
B	890-333	97/90
B/2	890-334	57/50
B/3	890-335	40/33
C, R	890-317	97/90
C/2	890-331	57/49,36
C/3	890-332	41/34
R/2	890-348	57/50
R/3	890-336	41/34,76

B-, C-Male Connectors, R-Female Connectors



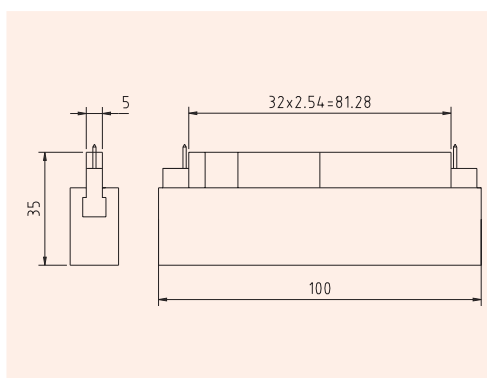
Type	Part Numbers	A/B (mm)
B	890-302	96/89
B/2	890-303	55/48
B/3	890-304	40/33
C, R	890-305	96/89
C/2,R/2	890-306	55/48
C/3,R/3	890-307	40/33

M-Female Connectors



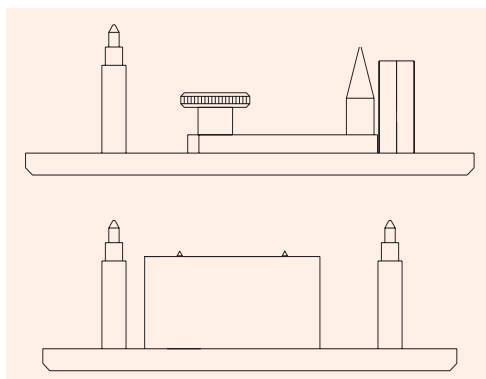
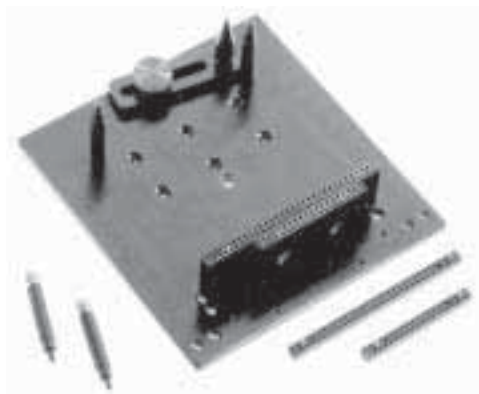
Type	Part Numbers	A/B (mm)
M6+10	890-112-W6	95/-
M24+8	890-112-W24	95/-
M42+6	890-112-W42	95/-
M60+4	890-112-W60	95/-
M78+2	890-112-W78	95/-
M/2	890-113	54/-
M/3	890-114	39/-

VarPol Straight Headers, Female Connectors, Connector Strips



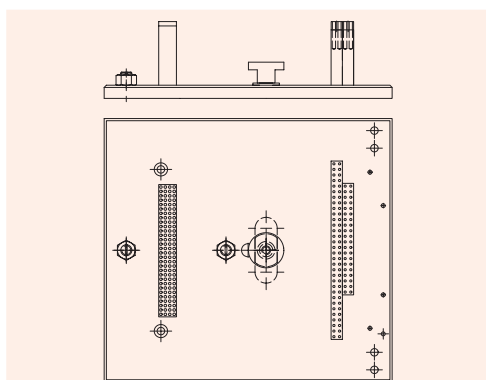
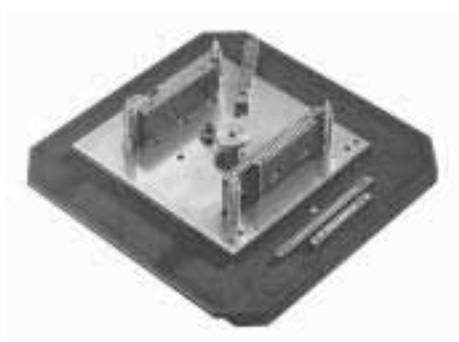
Type	Part Numbers	A/B (mm)
1-row	890-330	—
2-row	890-323	—

PC/104 Female Connectors



Type	Part Number	A/B (mm)
PC104	890-600-W1	—

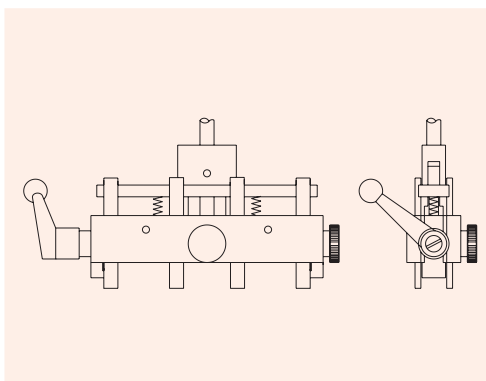
PC/104 and PC/104 plus Female Connectors



Type	Part Number	A/B (mm)
PC104+	890-602-W1	—

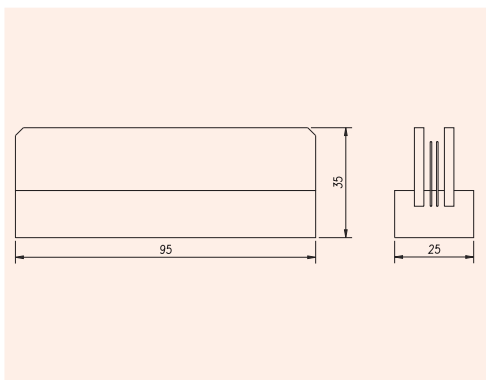
Repair Tools for ept-Connectors

Ejector Tool for Type B, C, D, E, F, F-low profile



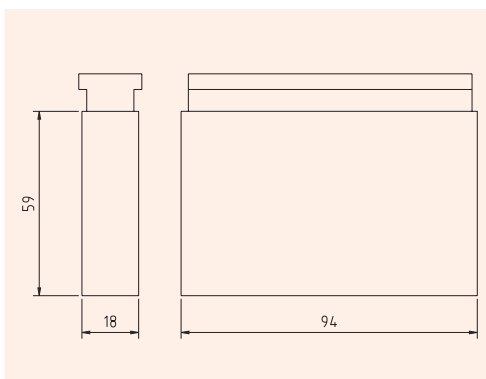
Type	Part Numbers	A/B (mm)
1/1	892-100	—
1/2	892-103	—
1/3	892-104	—

Support block for disassembly



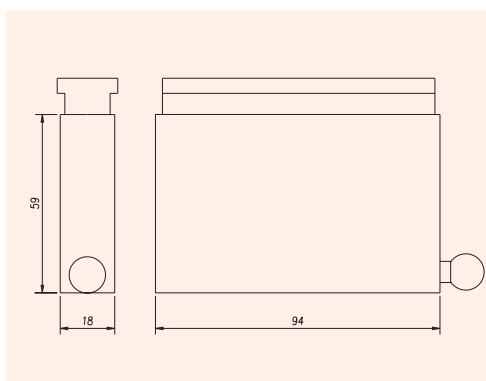
Type	Part Numbers	A/B (mm)
B, C	892-300	—
R	892-304	—
D	892-301	—
E	892-302	—
F-flach	892-303	—

Extraction Tool for short pins



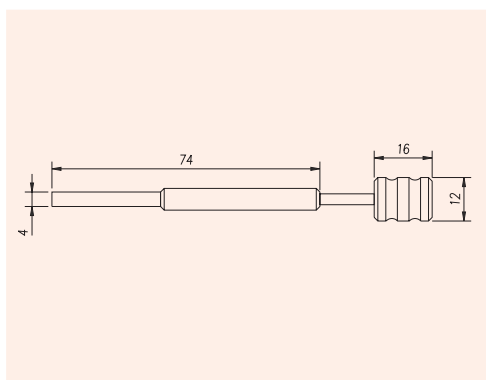
Type	Part Number	A/B (mm)
—	892-210	—

Extraction Tool for Pins 13/17 mm



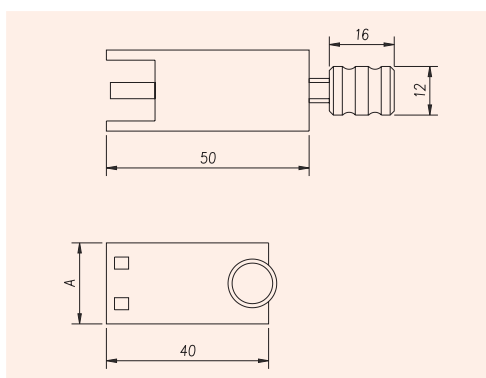
Type	Part Number	A/B (mm)
B,C,R	892-200	—
D,E	892-201	—
F-flach	892-202	—

Extraction Tool for single pins



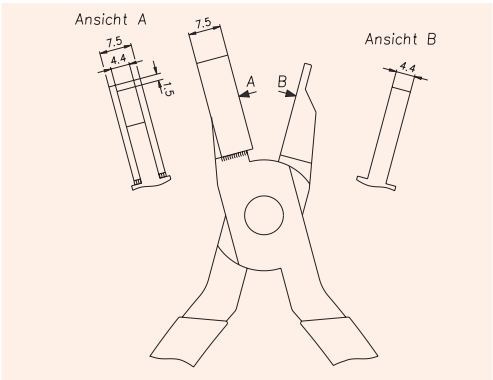
Type	Part Numbers	A/B (mm)
0,6x0,6	892-203	—

Insertion Tool for straight single pins



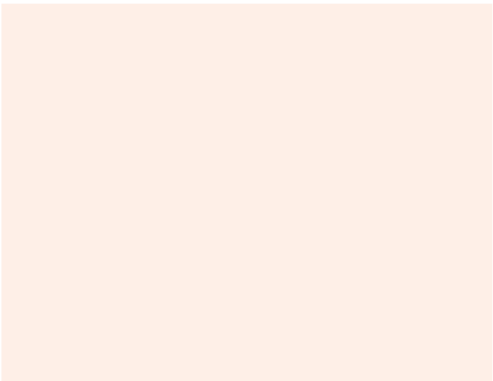
Type	Part Numbers	A/B (mm)
B	892-400	—
C	892-401	—
R	892-405	—
D	892-402	—
E	892-403	—
F-flach	892-404	—

Keying Pliers



	Part Number	A/B (mm)
Zange	894-301	—

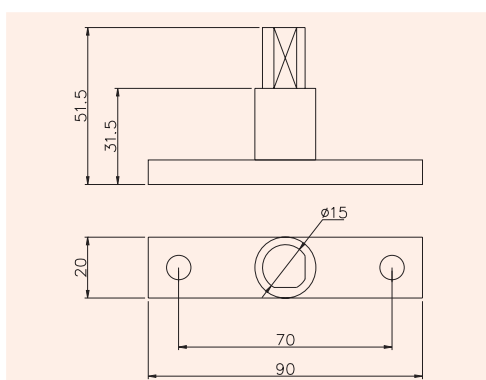
Tool for Lower Shield



Type	Part Number	A/B (mm)
5-row	884-740-W2	—
8-row	884-740-W3	—

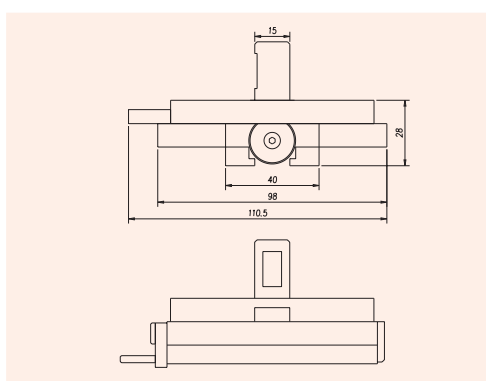
Tool-Adaptor

Fixed head adaptor



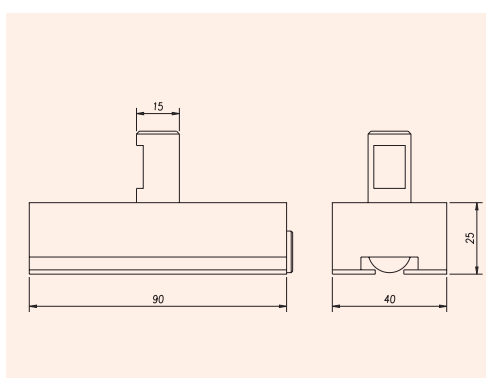
Type	Part Number	A/B (mm)
Starr	882-208	—

Rotation Tool Adaptor



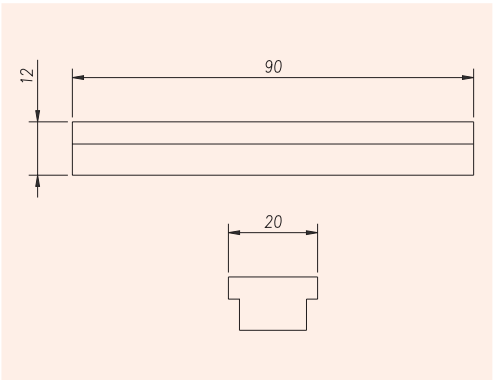
Type	Part Number	A/B (mm)
Dreh	882-204	—

Quick Release Support



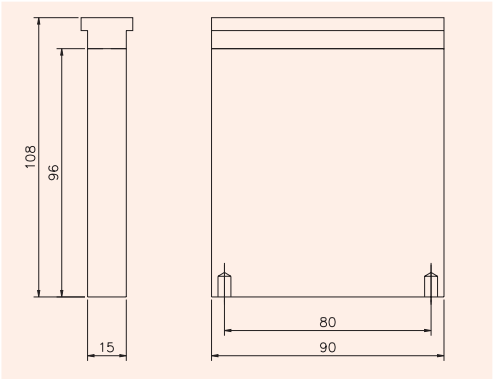
Type	Part Number	A/B (mm)
Starr	882-201	—

Quick Release Mounting



Type	Part Number	A/B (mm)
T-Stück	882-300	—

Alignment tool



Type	Part Number	A/B (mm)
	882-903	—

Part Numbers	Page	Part Numbers	Page	Part Numbers	Page	Part Numbers	Page
090-10161	3.57	102-65026-xx	3.16	103-69014	3.23	104-60054-xx	3.21
090-10162	3.57	102-65065-xx	3.16	103-69064	3.23	104-60061-xx	3.27
090-10163	3.57	102-65066-xx	3.16	103-78006	3.22	104-60464-03	3.11
090-10164	3.57	102-68014-xx	3.14, 3.18	103-78016	3.22	104-60565-03	3.13
101-40024	4.2	102-69004-xx	3.19	103-78106	3.22	104-65012-xx	3.28, 3.30
101-40025	4.2	102-69064-xx	3.19	103-78116	3.22	104-65015-xx	3.21
101-40044	4.2	102-78016-xx	3.18	103-79006	3.23	104-65016-xx	3.21
101-40064	4.2	102-78116-xx	3.18	103-79016	3.23	104-65042-xx	3.28
101-40065	4.2	102-79006-xx	3.19	103-79066	3.23	104-65045-xx	3.21
101-40074	4.2	102-79066-xx	3.19	103-79106	3.23	104-65046-xx	3.21
101-60004	3.17	102-79106-xx	3.19	103-79116	3.23	104-65052-xx	3.28
101-60014	3.17	102-79166-xx	3.19	103-79166	3.23	104-65055-xx	3.21
101-60064	3.17	102-80004	4.5	103-80004	4.9	104-65062-xx	3.28
101-65005	3.17	102-80005	4.5	103-80006	4.9	104-65465-03	3.11
101-65006	3.17	102-80006	4.5	103-80014	4.9	104-65466-03	3.11
101-65015	3.17	102-80025	4.5	103-80016	4.9	104-65565-03	3.13
101-65016	3.17	102-80064	4.5	103-80255	4.9	104-69004-xx	3.22
101-65065	3.17	102-80065	4.5	103-80265	4.9	104-79006-xx	3.22
101-65066	3.17	102-80066	4.5	103-90004	4.8	104-79106-xx	3.22
101-68014	3.19	102-80075	4.5	103-90006	4.8	104-79116-xx	3.22
101-69004	3.19	102-90004	4.4	103-90014	4.8	104-80014	4.9
101-69014	3.19	102-90005	4.4	103-90016	4.8	104-80015	4.9
101-78016	3.19	102-90006	4.4	103-90064	4.8	104-80016	4.9
101-78116	3.19	102-90025	4.4	103-90066	4.8	104-80035	4.9
101-79006	3.19	102-90064	4.4	103-90105	4.8	104-80064	4.9
101-79016	3.19	102-90065	4.4	103-90115	4.8	104-80065	4.9
101-79106	3.19	102-90066	4.4	103-90165	4.8	104-80066	4.9
101-79116	3.19	102-90075	4.4	104-19002	4.35	104-80075	4.9
101-80004	4.5	103-40014	4.6	104-19003	3.8	104-80154	4.9
101-80006	4.5	103-40015	4.6	104-40014	4.7	104-80174	4.9
101-80014	4.5	103-40044	4.6	104-40015	4.7	104-90004	4.8
101-80016	4.5	103-40045	4.6	104-40016	4.7	104-90005	4.8
101-80105	4.5	103-40054	4.6	104-40044	4.7	104-90006	4.8
101-80115	4.5	103-40055	4.6	104-40045	4.7	104-90014	4.8
101-90004	4.4	103-40064	4.6	104-40046	4.7	104-90015	4.8
101-90006	4.4	103-40065	4.6	104-40054	4.7	104-90016	4.8
101-90014	4.4	103-40144	4.6	104-40055	4.7	104-90035	4.8
101-90016	4.4	103-40154	4.6	104-40056	4.7	104-90064	4.8
101-90105	4.4	103-40174	4.6	104-40064	4.7	104-90065	4.8
101-90115	4.4	103-40194	4.6	104-40065	4.7	104-90066	4.8
102-40024	4.3	103-60014	3.20	104-40066	4.7	104-90075	4.8
102-40025	4.3	103-60044	3.20	104-40075	4.7	104-90154	4.8
102-40026	4.3	103-60054	3.20	104-40115	4.7	104-90174	4.8
102-40044	4.3	103-60064	3.20	104-40144	4.7	104-90194	4.8
102-40064	4.3	103-65015	3.20	104-40154	4.7	105-40014	4.14
102-40065	4.3	103-65016	3.20	104-40174	4.7	105-40016	4.14
102-40066	4.3	103-65045	3.20	104-40194	4.7	105-40064	4.14
102-40074	4.3	103-65046	3.20	104-49054	4.35	105-40066	4.14
102-49064	4.34	103-65055	3.20	104-49057	4.35	106-40064	4.15
102-63014-xx	3.16	103-65056	3.20	104-49064	4.35	106-40065	4.15
102-63024-xx	3.16	103-65065	3.20	104-49067	4.35	106-40066	4.15
102-63064-xx	3.16	103-65066	3.20	104-60014-xx	3.21	106-40075	4.15
102-65015-xx	3.16	103-68004	3.22	104-60041-xx	3.27	106-40084	4.15
102-65016-xx	3.16	103-68014	3.22	104-60044-xx	3.21	106-60004	3.37
102-65025-xx	3.16	103-69004	3.23	104-60051-xx	3.27	106-60015	3.37

Part Numbers	Page	Part Numbers	Page	Part Numbers	Page	Part Numbers	Page
106-60064	3.37	110-61005	3.40, 3.41	115-65056	3.33	118-40502	4.32
106-60065	3.37	110-61084	3.40, 3.41	115-65065	3.33	118-40504	4.32
107-40014	4.16	111-40064	4.22	115-65066	3.33	118-40505	4.32
107-40015	4.16	111-40164	4.22	115-66055	3.36	118-40507	4.32
107-40016	4.16	111-40264	4.22	115-66056	3.36	118-40508	4.32
107-40024	4.16	112-40064	4.23	115-66065	3.36	118-40581	4.32
107-40025	4.16	112-40065	4.23	115-66066	3.36	118-40584	4.32
107-40026	4.16	112-40084	4.23	115-68014	3.35, 3.42, 3.43	118-50587	4.32
107-40064	4.16	112-40095	4.23	115-69054	3.35	118-60006	3.45
107-40065	4.16	113-40010	4.24	115-69055	3.35	118-60016	3.45
107-40066	4.16	113-40015	4.24	115-69056	3.35	118-60084	3.45
108-40014	4.17	113-40020	4.24	115-69064	3.35	124-60022-00	3.28
108-40015	4.17	113-40030	4.24	115-69065	3.35	124-60112-00	3.27
108-40024	4.17	113-40035	4.24	115-69066	3.35	124-60122-00	3.27
108-40025	4.17	113-40040	4.24	115-78015	3.35, 3.42, 3.43	124-69122-00	3.30
108-40034	4.17	113-40060	4.26	115-78016	3.35	243-11020-15	2.9
108-40036	4.17	113-40070	4.26	115-79055	3.35	243-11310-15	2.9
108-40044	4.17	113-40160	4.26	115-79056	3.35	243-11320-15	2.9
108-40046	4.17	114-30000	4.25, 4.28	115-79065	3.35	243-11322-15	2.9
108-40064	4.17	114-40040	4.25	115-79066	3.35	243-11323-15	2.9
108-40065	4.17	114-40050	4.28	115-90014	4.12, 4.13	243-11360-15	2.9
108-40074	4.17	114-40060Z	4.27	115-90015	4.12, 4.13	243-11735-15	2.9
108-40076	4.17	114-4007	4.27	115-90016	4.12, 4.13	243-21010-15	2.12
108-40084	4.17	114-40080	4.29	115-90064	4.12	243-21020-15	2.12
108-60015	3.38	114-40090	4.29	115-90065	4.12	243-21310-15	2.12
108-60025	3.38	114-40100	4.29	115-90066	4.12	243-21320-15	2.12
108-60044	3.38	115-15301	3.56	116-40034	4.11	243-22310-15	2.14
108-60054	3.38	115-15302	3.56	116-40044	4.11	243-22311-15	2.14
108-60065	3.38	115-15401	3.56	116-40054	4.11	243-22320-15	2.14
108-60084	3.38	115-15402	3.56	116-40074	4.11	243-22360-15	2.14
109-40014	4.18	115-40014	4.10	116-60054	3.33	243-23010-15	2.16
109-40015	4.18	115-40015	4.10	116-60074	3.33	243-23310-15	2.16
109-40024	4.18	115-40024	4.10	116-69054	3.35	243-23320-15	2.16
109-40025	4.18	115-40025	4.10	116-69064	3.35	243-23360-15	2.16
109-40064	4.18	115-40026	4.10	116-90051	4.12	243-31010-15	2.18
109-40065	4.18	115-40034	4.10	116-90054	4.12	243-31020-15	2.18
110-40004	4.19	115-40035	4.10	116-90057	4.12	243-31310-15	2.18
110-40005	4.19	115-40036	4.10	116-90061	4.12	243-31320-15	2.18
110-40014	4.19	115-40046	4.10	116-90064	4.12	243-41010-15	2.36
110-40015	4.19	115-40054	4.10	116-90067	4.12	243-41310-15	2.36
110-40024	4.19	115-40064	4.10	117-40064	4.30	243-42010-15	2.36
110-40025	4.19	115-40065	4.10	117-40065	4.30	243-42310-15	2.36
110-40036	4.19	115-40066	4.10	118-21062	3.45, 4.32	243-51000	2.34
110-40046	4.19	115-40074	4.10	118-21063	3.45, 4.32	243-52000	2.38
110-40064	4.19	115-60014	3.33	118-21064	3.45, 4.32	243-53000	2.34
110-40065	4.19	115-60044	3.33	118-40004	4.31	243-54000	2.38
110-40076	4.19	115-60054	3.33	118-40005	4.31	243-5511-1	2.41
110-40084	4.19	115-60064	3.33	118-40014	4.31	243-5511-2	2.41
110-40504	4.20	115-61054	3.36	118-40015	4.31	243-5511-3	2.41
110-40505	4.20	115-61064	3.36	118-40024	4.31	243-5511-4	2.41
110-40584	4.20	115-65015	3.33	118-40025	4.31	243-5511-5	2.41
110-60014	3.41	115-65016	3.33	118-40064	4.31	243-5525-1	2.41
110-60024	3.41	115-65045	3.33	118-40065	4.31	243-5525-2	2.41
110-60065	3.41	115-65046	3.33	118-40084	4.31	243-5525-3	2.41
110-61004	3.40, 3.41	115-65055	3.33	118-40501	4.32	243-5525-4	2.41

Part Numbers	Page	Part Numbers	Page	Part Numbers	Page	Part Numbers	Page
243-5725-3	2.40	244-63300-15	2.25	884-262	5.6	890-102	5.10
243-5725-4	2.40	244-63300-25	2.25	884-303	5.7	890-112-W24	5.11
243-5725-5	2.40	245-11010-15	2.26	884-305	5.7	890-112-W42	5.11
243-61010-15	2.20	245-11310-15	2.26	884-401	5.7	890-112-W6	5.11
243-61310-15	2.20	245-21010-15	2.28	884-406	5.7	890-112-W60	5.11
243-61320-15	2.20	245-21310-15	2.28	884-451	5.7	890-112-W78	5.11
243-61360-15	2.20	245-31010-15	2.30	884-453	5.7	890-113	5.11
243-62010-15	2.22	245-31310-15	2.30	884-500	5.7	890-114	5.11
243-62310-15	2.22	245-61010-15	2.32	884-501	5.7	890-302	5.11
243-62320-15	2.22	245-61310-15	2.32	884-502	5.7	890-303	5.11
243-62360-15	2.22	246-11000-15	2.27	884-503	5.7	890-304	5.11
243-63010-15	2.24	246-11300-15	2.27	884-525	5.8	890-305	5.11
243-63310-15	2.24	246-11600-1	2.27, 2.33	884-526	5.8	890-306	5.11
243-63320-15	2.24	246-21000-15	2.29	884-527	5.8	890-307	5.11
243-63360-15	2.24	246-21300-15	2.29	884-540-W6	5.8	890-317	5.10
244-11000-15	2.10	246-21600-1	2.29	884-540-W24	5.8	890-323	5.11
244-11000-25	2.10	246-31000-15	2.31	884-540-W42	5.8	890-330	5.11
244-11300-15	2.10	246-31300-15	2.31	884-540-W60	5.8	890-331	5.10
244-11300-25	2.10	246-31600-1	2.31	884-540-W78	5.8	890-332	5.10
244-11305-15	2.10	246-61000-15	2.33	884-541	5.8	890-333	5.10
244-11600-1	2.10, 2.21	246-61300-15	2.33	884-542	5.8	890-334	5.10
244-21000-15	2.13	304-60054-02	3.24	884-700-W125	5.4	890-335	5.10
244-21000-25	2.13	304-60064-02	3.24	884-701-W119	5.4	890-336	5.10
244-21300-15	2.13	304-65055-03	3.24	884-701-W122	5.4	890-348	5.10
244-21300-25	2.13	304-65056-04	3.24	884-701-W125	5.4	890-600-W1	5.12
244-21600-1	2.13	304-65065-03	3.24	884-702-W11	5.4	892-100	5.13
244-22000-15	2.15	304-65066-04	3.24	884-702-W111	5.4	892-103	5.13
244-22000-25	2.15	304-78006-02	3.25	884-703-W147	5.4	892-104	5.13
244-22300-15	2.15	304-78016-02	3.25	884-706	5.4	892-200	5.14
244-22300-25	2.15	304-78106-03	3.25	884-708-W22	5.3	892-201	5.14
244-22600-1	2.15	304-78106-04	3.23, 3.25	884-708-W25	5.3	892-202	5.14
244-23000-15	2.17	304-78116-03	3.25	884-710-W125	5.4	892-203	5.14
244-23000-25	2.17	304-78116-04	3.23, 3.25	884-710-W25	5.2	892-300	5.13
244-23300-15	2.17	304-79016-02	3.23, 3.25	884-711-W125	5.4	892-301	5.13
244-23300-25	2.17	304-79066-02	3.23, 3.25	884-711-W25	5.2	892-302	5.13
244-23600-1	2.17	304-79116-03	3.23, 3.25	884-712-W25	5.3	892-303	5.13
244-31000-15	2.19	304-79116-04	3.25	884-713-W11	5.2	892-304	5.13
244-31000-25	2.19	304-79166-03	3.23, 3.25	884-720-W11	5.4	892-400	5.14
244-31300-15	2.19	304-79166-04	3.25	884-720-W19	5.4	892-401	5.14
244-31300-25	2.19	306-65069-14	3.14	884-720-W22	5.4	892-402	5.14
244-31600-1	2.19, 2.37	882-204	5.17	884-720-W25	5.4	892-403	5.14
244-41000-15	2.37	884-100	5.7	884-720-W47	5.4	892-404	5.14
244-41300-15	2.37	884-101	5.7	886-461-xx	5.9	892-405	5.14
244-51000	2.35	884-102	5.7	886-462-xx	5.9	894-301	5.15
244-52000	2.39	884-150	5.6	886-463-xx	5.9	910-20015	3.55
244-61000-15	2.21	884-151	5.6	886-466-xx	5.9	910-20020	3.55
244-61000-25	2.21	884-152	5.6	886-467-xx	5.9	910-20145	3.55
244-61300-15	2.21	884-200	5.7	886-600	5.8	910-20150	3.55
244-61300-25	2.21	884-201	5.7	886-601-1	5.8	910-22015	3.55
244-62000-15	2.23	884-202	5.7	886-604	5.8	910-22020	3.55
244-62000-25	2.23	884-250	5.6	886-650	5.9	910-22715/1	3.55
244-62300-15	2.23	884-251	5.6	886-900-W1	5.7	910-22720/1	3.55
244-62300-25	2.23	884-252	5.6	886-900-W3	5.7	910-60045	3.55
244-63000-15	2.25	884-260	5.6	890-100-W1	5.10	910-60050	3.55
244-63000-25	2.25	884-261	5.6	890-101	5.10	910-60645/1	3.55

Part Numbers	Page	Part Numbers	Page	Part Numbers	Page	Part Numbers	Page
910-60650/1	3.55	972-nn013-yx	3.53				
911-32006	3.55	972-nn019-ab	3.53				
911-32046	3.55	972-nn020-yx	3.53				
916-31002	3.31	972-nn021-yx	3.53				
916-31012	3.31	972-nn022-yx	3.53				
916-31022	3.31	972-nn023-yx	3.53				
916-51002	3.31	972-nn029-ab	3.53				
916-51022	3.31	972-nn039-ab	3.53				
916-61002	3.31	981-nn010-jk	3.52				
930-61xx0	3.47	981-nn011-jk	3.52				
930-61xx4	3.47	982-nn010-jk	3.52				
930-66xx4	3.47	982-nn011-jk	3.52				
932-61xx0	3.47						
932-61xx4	3.47						
932-66xx4	3.47						
961-60543-03	3.46						
961-60543-07	3.46						
961-60543-12	3.46						
961-60546-03	3.46						
961-60546-07	3.46						
961-60546-12	3.46						
961-60nn3-17	3.46						
961-60nn6-17	3.46						
962-60203-03	3.48						
962-60203-12	3.48						
962-60206-03	3.48						
962-60206-12	3.31, 3.48						
962-60323-03	3.48						
962-60323-12	3.48						
962-60326-03	3.48						
962-60326-12	3.48						
962-60543-03	3.46						
962-60543-07	3.46						
962-60543-12	3.46						
962-60546-07	3.46						
962-60546-12	3.46						
962-60nn3-17	3.46						
962-60nn6-03	3.46						
962-60nn6-17	3.46						
971-nn009-ab	3.53						
971-nn010-yx	3.53						
971-nn011-yx	3.53						
971-nn012-yx	3.53						
971-nn013-yx	3.53						
971-nn019-ab	3.53						
971-nn020-yx	3.53						
971-nn021-yx	3.53						
971-nn022-yx	3.53						
971-nn023-yx	3.53						
971-nn029-ab	3.53						
971-nn039-ab	3.53						
972-nn009-ab	3.53						
972-nn010-yx	3.53						
972-nn011-yx	3.53						
972-nn012-yx	3.53						

