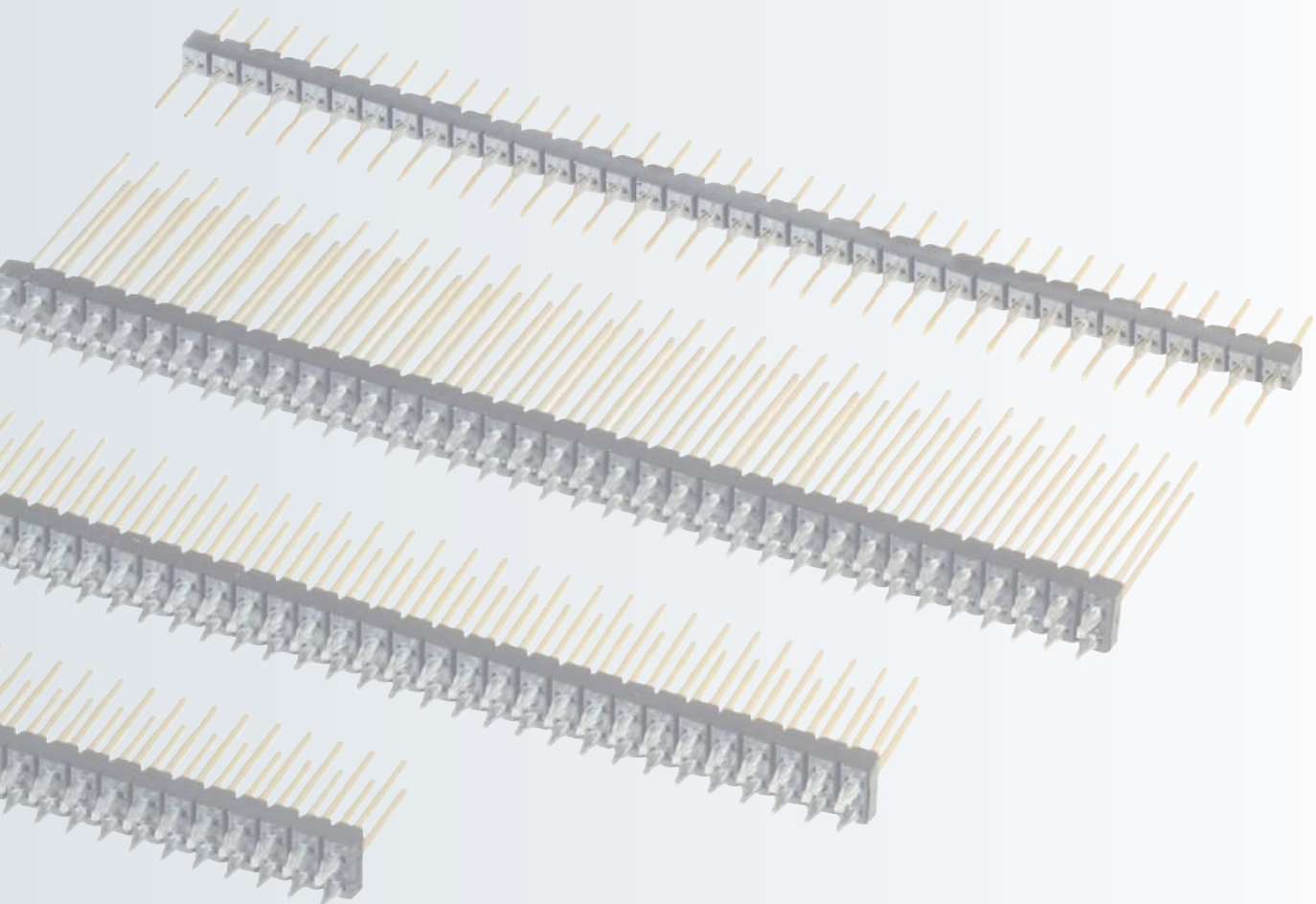


## VarPol Pin Headers and Socket Strips



Introduction	180
Overview	181
Explanation	182
PCB Distances	183
Technical Specifications	184
Hole Specifications	185
<b>VarPol Female Connector</b>	<b>186</b>
<b>VarPol Guiding Block</b>	<b>188</b>
<b>VarPol Straight Pin Header</b>	<b>190</b>
<b>VarPol Angled Pin Header</b>	<b>192</b>
<b>Socket Connector</b>	<b>194</b>

## VarPol - 2.54 mm Pin Headers and Socket Strips in Press-fit

### High Quality, Adaptable and Robust

Pin headers and sockets from ept offer a plethora of possibilities for connecting circuit boards. One or two rows, variable pin counts, different termination lengths, straight or angled – the choice is yours! The product also allows for seamlessly connecting sockets.

In addition, Tcom press®, our tried and proven press-fit zone, allows you to eliminate the soldering process and greatly increase connection reliability.

### Key Features:

- a large selection of contact lengths and termination lengths
- a choice of performance levels: 50 and 200 mating cycles
- sockets can be joined end-to-end
- simple and inexpensive processing
- Tcom press® press-fit zone

### Applications:

- Board-to-Board distance from 11.45 mm to 35.45 mm
- no soldering process thanks to Press-fit

### Termination



Press-fit



Solder

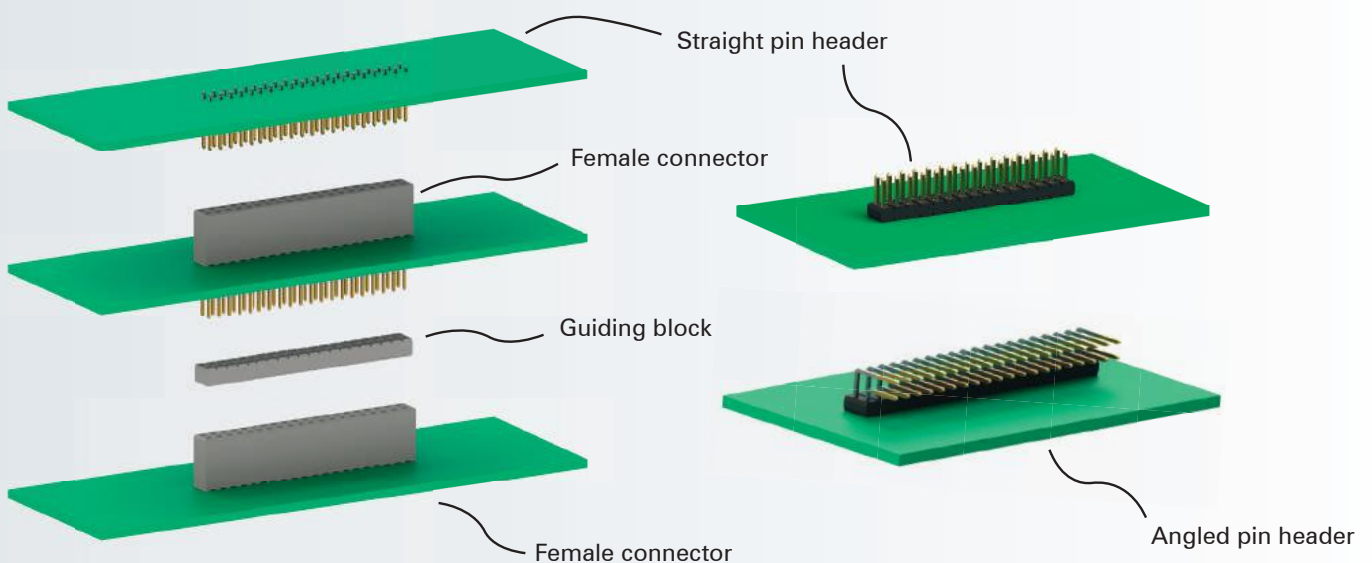
### Mating Configuration



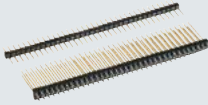




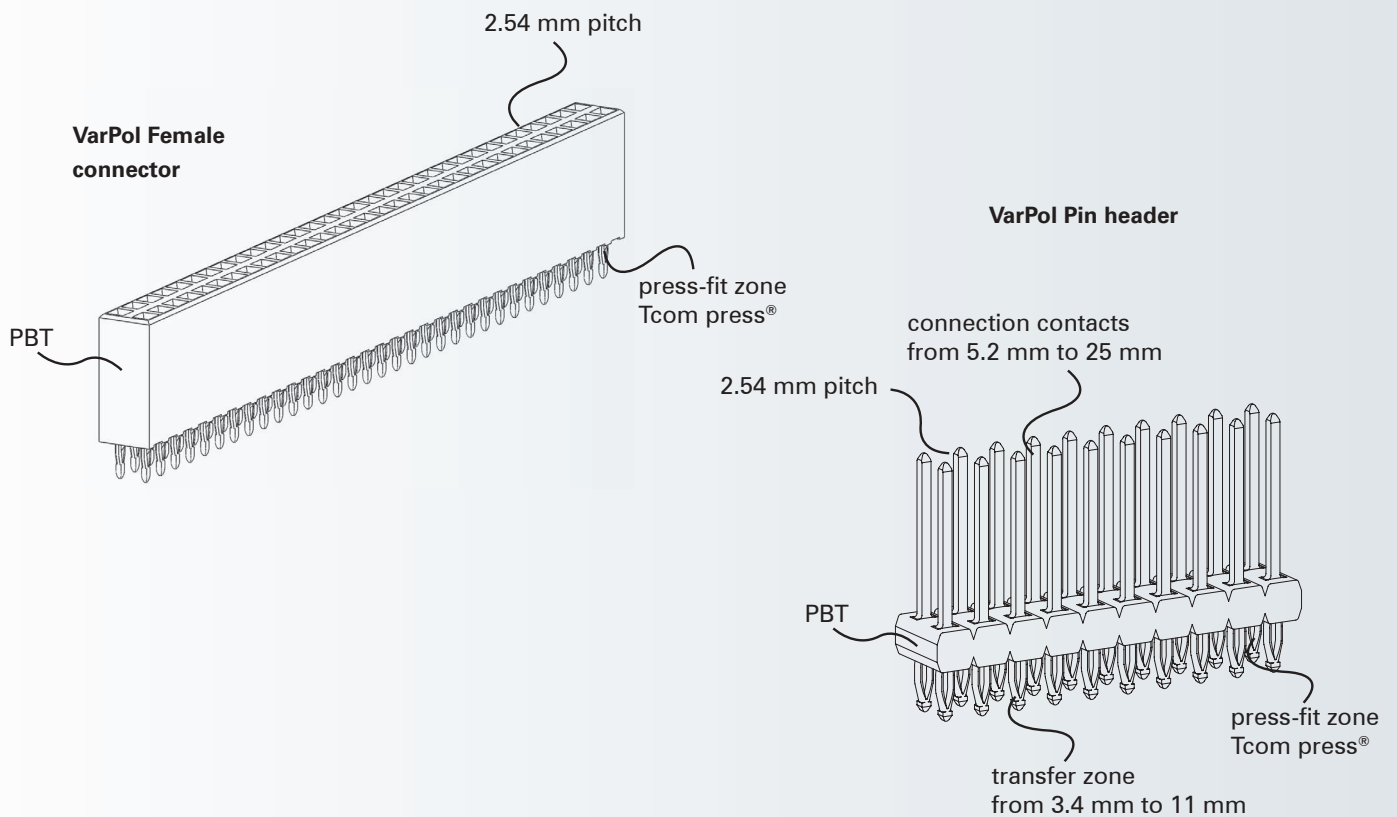
Perpendicular



Parallel



Type	Pitch (mm)	max. number of contacts	Termination	Mating connector	Page reference
	2.54	36 / 108	Press-fit, solder	VarPol Female connector Pin header	S. 186
	2.54	108			S. 188
	2.54	36 / 108	Press-fit	VarPol Female connector	S. 190
	2.54	36 / 108	Press-fit	VarPol Female connector	S. 192
	2.54	32 / 64	Press-fit	VarPol socket connector	S. 194



## Stack it with VarPol

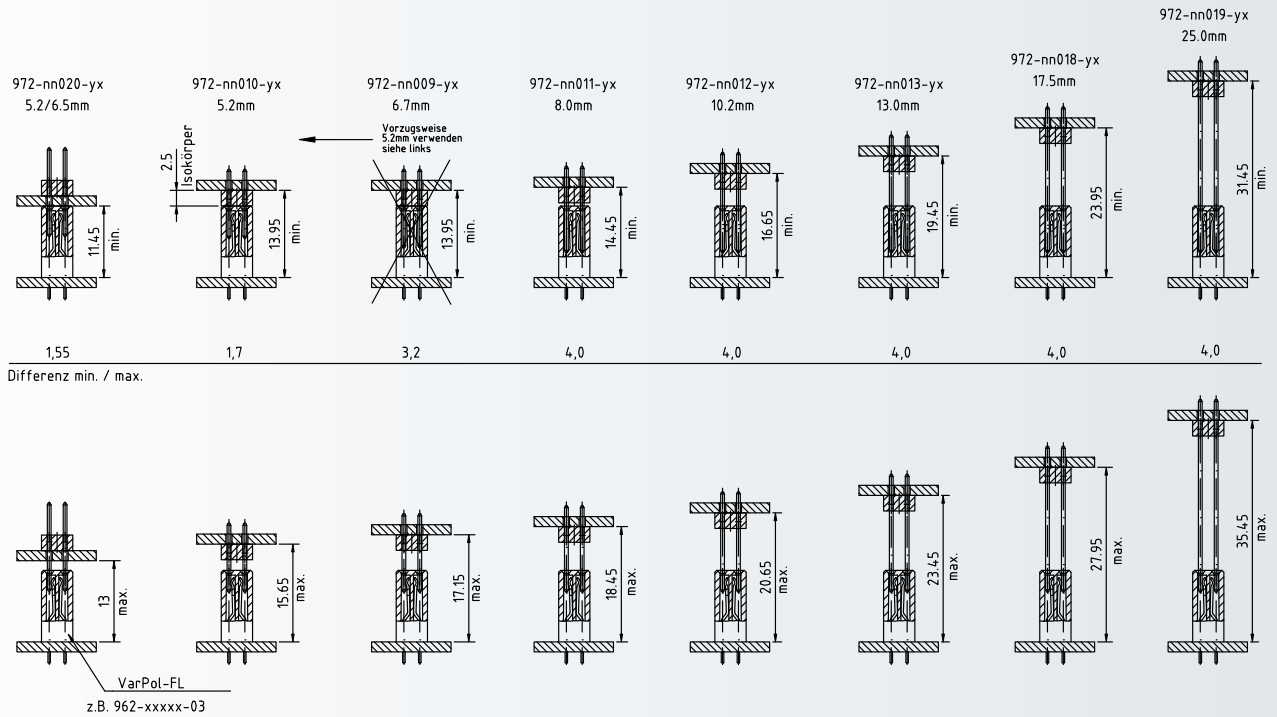
VarPol pin headers and sockets based on the press-fit system make it possible to connect circuit boards with one another in parallel:

- board-to-board distance of 11.45 mm up to 35.45 mm using various termination lengths of the multi-pin connector
- single or double row
- number of contacts is freely selectable (no upper limit, as the connectors can be arranged next to one another without the loss of a pitch)
- interchange zone as an option
- female in soldering or press-fit technology

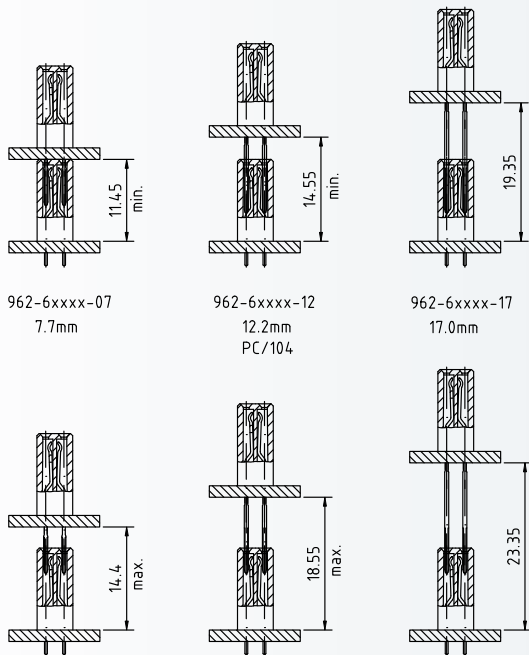
Connecting the connector with the circuit board using press-fit technology ensures a highly robust and resilient connection. High-quality press-fit connections, such as the Tcom press® from ept, offer demonstrably better contact reliability than soldering connections. The cold welding between the contact and the circuit board hole resulting from press-in is highly mechanically stable and of a high electrical quality. It is remarkably easy and reliable to process using the associated processing tools offered by ept.

It is also possible to vertically stack multiple circuit boards, whereby female connectors with a rear mating zone are used. Board-to-board distances of 11.45 mm up to 19.35 mm can be achieved here. Using a guiding system on the underside of the upper circuit board also supports stable contact management and prevents mismatching. Angled pin headers provide the option to implement right-angled connections with the same level of versatility and reliability, in addition to the parallel connection of circuit boards.

System: VarPol Female connector / VarPol Pin header

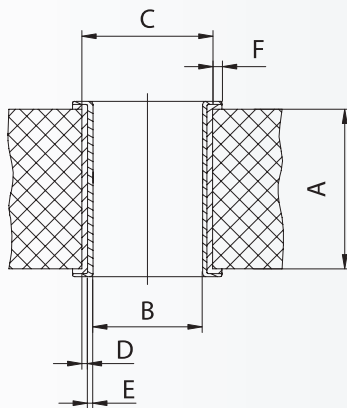


System: VarPol Female connector / VarPol Female connector without guiding block



## Technical Specifications

Technical Specifications	VarPol Connectors		
	Testing Standard	Female connectors, Pin headers	Socket connector
<b>Basics</b>			
Number of contacts		2 to 108	2 to 64
Operating temperature range		-55°C to +125°C	
<b>Material</b>			
Insulator material		PBT glass filled	
Contact material		Copper alloy	
Contact surface		Au over NiP over Ni	Sn or Au over Ni
<b>Mechanical</b>			
Pitch		2.54 mm	
Mating force per pin		max. 0.9 N	max. 1.8 N
Separating force per pin		max. 0.6 N	min. 1 N
Durability	IEC 60512-9-1:2010	Perf. level II = 250 mating cycles Perf. level III = 50 mating cycles	-
<b>Electrical</b>			
Operational current	IEC 60512-5-2:2002	max. 1.9 A	max. 1 A
Operating voltage		150 V	100 V
Contact resistance	IEC 60512-2-1:2002	< 20 mΩ	< 10 mΩ
Clearance and creepage		1.2 mm	> 0.6 mm
Insulation resistance	IEC 60512-3-1:2002	> 10 <sup>6</sup> MΩ	
<b>Approval</b>			
Flammability		UL (file: E130314)	
Environment		RoHS compliant	



## Hole Specifications Press-fit

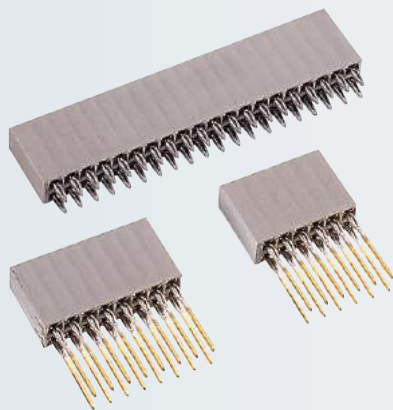
### Plated through-hole according to IEC 60352-5


ept offers adapted press-fit zones for various new board surfaces.

		VarPol
Nominal hole		Ø 1.0 mm
<b>imm. Sn printed circuit boards</b>		
<b>A</b>	PCB thickness	min. 1.4 mm
<b>B</b>	Plated hole	Ø 1 + 0.09/- 0.06 mm
<b>C</b>	Drill hole	1.15 ± 0.025 mm
<b>D</b>	Cu plating	min. 25 µm
<b>E</b>	imm. Sn plating	max. 1.5 µm
<b>F</b>	Annular ring	min. 0.1 mm
<b>Ni, Au printed circuit boards</b>		
<b>A</b>	PCB thickness	min. 1.4 mm
<b>B</b>	Plated hole	Ø 1 + 0.09/- 0.06 mm
<b>C</b>	Drill hole	1.15 ± 0.025 mm
<b>D</b>	Cu plating	min. 25 µm
<b>E</b>	Ni, Au plating	0.05 – 0.2 µm Au over 2.5 – 5 µm Ni
<b>F</b>	Annular ring	min 0.1 mm
<b>pure Cu printed circuit boards</b>		
<b>A</b>	PCB thickness	min. 1.4 mm
<b>B</b>	Plated hole	Ø 1 + 0.09/- 0.06 mm
<b>C</b>	Drill hole	1.15 ± 0.025 mm
<b>D</b>	Cu plating	min. 25 µm
<b>E</b>	OSP*	e. g. GLICOAT-SMD (F2) with 0.12 – 0.15 µm
<b>F</b>	Annular ring	min. 0.1 mm
<b>HAL Sn printed circuit boards</b>		
<b>A</b>	PCB thickness	min. 1.4 mm
<b>B</b>	Plated hole	Ø 1 + 0.09/- 0.06 mm
<b>C</b>	Drill hole	1.15 ± 0.025 mm
<b>D</b>	Cu plating	min. 25 µm
<b>E</b>	HAL Sn	5 – 15 µm
<b>F</b>	Annular ring	min. 0.1 mm

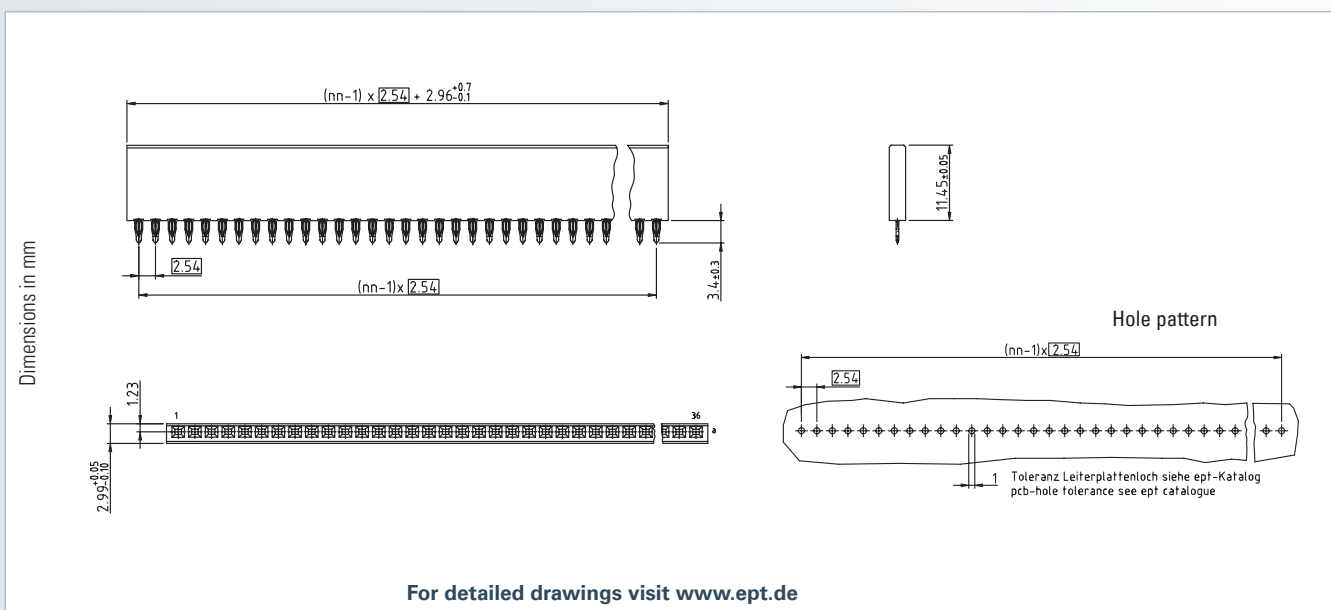
\* OSP = Organic Solderability Preservatives





**Type:** Female connector straight  
**Termination:** Press-fit, solder  
**Number of contacts:** 2 - 108  
**Pitch:** 2.54 mm  
**Operational current:** 1.9 A  
**Approval:** 



Technical Specifications on page 184



#### Accessories


- Processing tools p. 340
- 2-row guide block 962-17nn2/1 p. 188

#### Mating connector / Application:

-  VarPol Straight pin header (p. 190)
-  VarPol Angled pin header (p. 192)



**Press-fit** 

No. of contacts		Performance level	Termination length L 			
			3.4 mm	8.05 mm	12.2 mm	17 mm
			Part number			
1 - 36	1-row	II	961-60nn6-03	961-60nn6-07	961-60nn6-12	961-60nn6-17
		III	961-60nn2-03	961-60nn2-07	961-60nn2-12	961-60nn2-17
2 - 108	2-row	II	962-60nn6-03	962-60nn6-07	962-60nn6-12	962-60nn6-17
		III	962-60nn2-03	962-60nn2-07	962-60nn2-12	962-60nn2-17

**Ordering note**


nn=no. of contacts/row  
 Example for Female connector:  
 2-row, 100 contacts Performance level II, post length 3.4 mm ->  
**962-60506-03**

**On request**

- contact arrangement
- other contact surface



**Solder** 

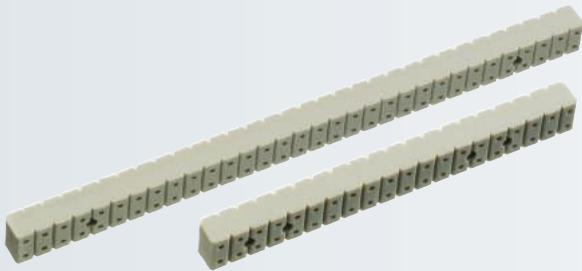
No. of contacts		Performance level	Termination length L 	
			3.4 mm	12.2 mm
			Part number	
1 - 36	1-row	II	961-40nn6-03	961-40nn6-12
		III	961-40nn2-03	961-40nn2-12
2 - 108	2-row	II	962-40nn6-03	962-40nn6-12
		III	962-40nn2-03	962-40nn2-12

**Ordering note**

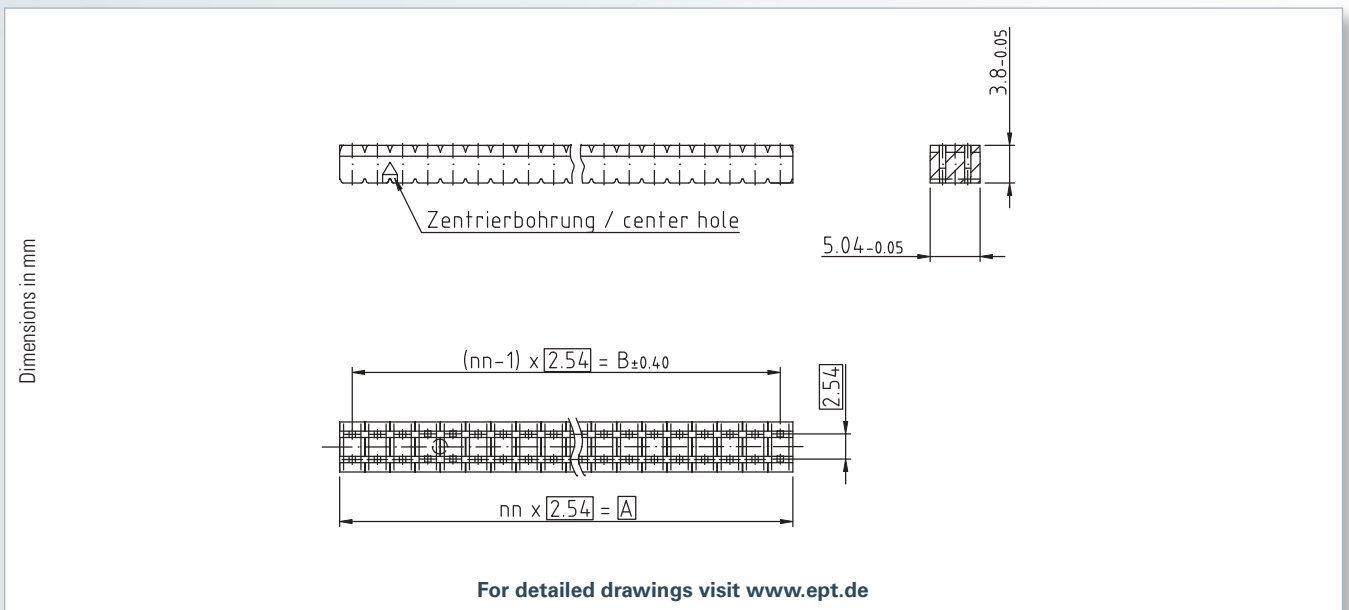
nn=no. of contacts/row  
 Example for female connector:  
 2-row, 100 contacts Performance level II, post length 3.4 mm ->  
**962-40506-03**

**On request**

- contact arrangement
- other contact surface



Führungskörper



	<b>VarPol</b>
	<b>Guiding block</b>
<b>No. of contacts</b>	<b>Part number</b>
2 - 108	962-17nn2/1

**Ordering note**

nn=no. of contacts/row  
 Example for Guiding block: 2-row,  
 100 contacts -> **962-17502/1**

**Note**


The guiding block supports the solid pin guiding at the bottom side of the PCB and avoids incorrect mating.

**Mating connector / Application:**

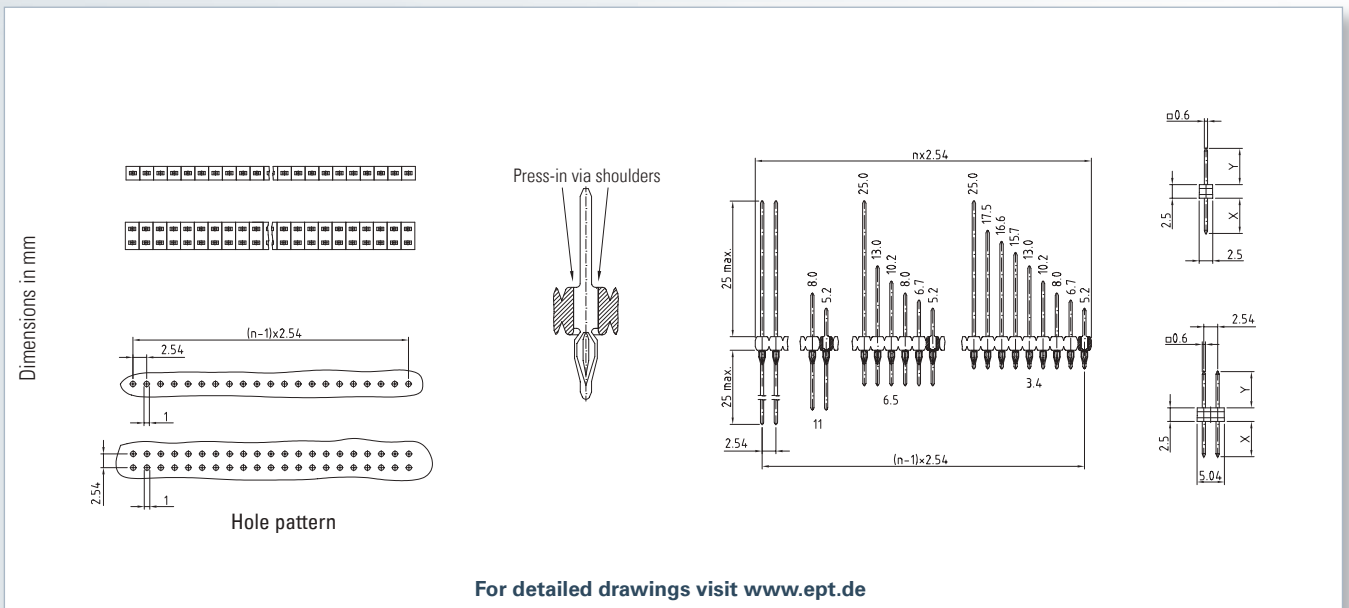


VarPol Female connector (p. 186)



**Type:** Male connector straight  
**Termination:** Press-fit  
**Number of contacts:** 2 - 108  
**Pitch:** 2.54 mm  
**Operational current:** 1.9 A  
**Approval:** 

Technical Specifications on page 184



**Accessories**

- Processing tools p. 340

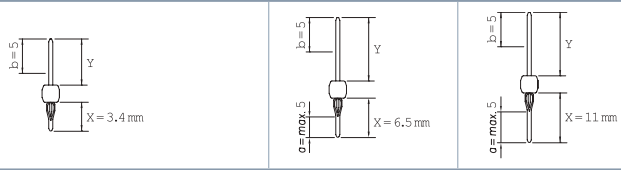
**Mating connector / Application:**



VarPol Female connector (p. 186)



**Press-fit 1-row**

No. of contacts	Y	Termination length			
					
		Part number			
		Performance level II	Performance level III	Performance level II	Performance level II
max. 36	5.2	971-nn010-21	971-nn010-31	971-nn020-22	971-nn050-22
	6.7	971-nn009-21	971-nn009-31	971-nn039-22	—
	8.0	971-nn011-21	971-nn011-31	971-nn021-22	971-nn051-22
	10.2	971-nn012-21	971-nn012-31	971-nn022-22	—
	13.0	971-nn013-21	971-nn013-31	971-nn023-22	971-nn053-22
	15.7	971-nn026-21	971-nn026-31	—	—
	16.6	971-nn006-21	971-nn006-31	—	—
	17.5	971-nn018-21	971-nn018-31	—	—
	25.0	971-nn019-21	971-nn019-31	971-nn029-22	—

**Ordering note**

nn=no. of contacts/row  
 Example for pin header: 2-row, 100 contacts Performance level II, length of termination side 3.4 mm, length of mating side 5.2 mm -> **972-50010-21**

**Note**

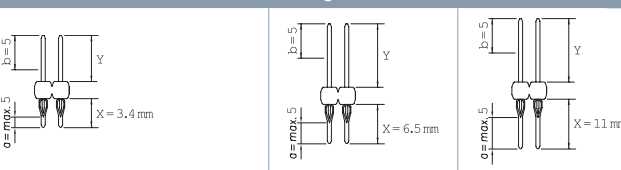
Performance level II = 250 mating cycles  
 Performance level III = 50 mating cycles

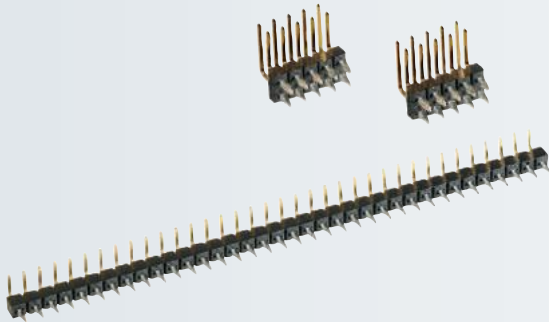
**On request**

- special contact length
- other contact surface



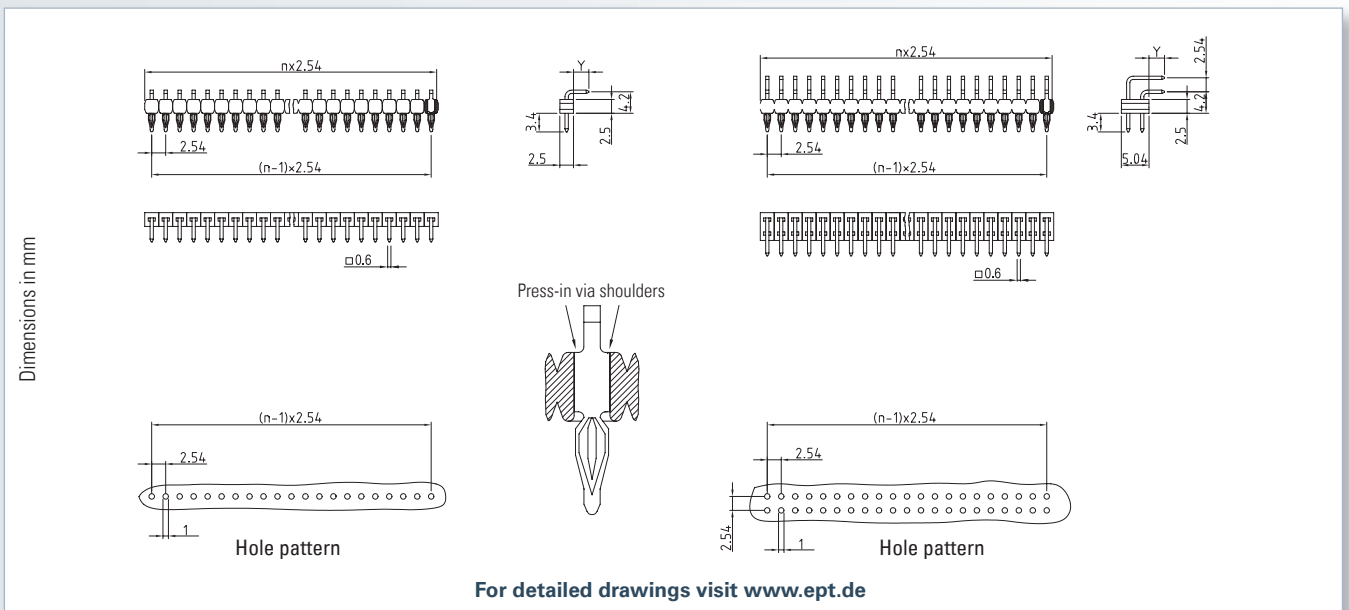
**Press-fit 2-row**

No. of contacts	Y	Termination length			
					
		Part number			
		Performance level II	Performance level III	Performance level II	Performance level II
max. 108	5.2	972-nn010-21	972-nn010-31	972-nn020-22	972-nn050-22
	6.7	972-nn009-21	972-nn009-31	972-nn039-22	—
	8.0	972-nn011-21	972-nn011-31	972-nn021-22	972-nn051-22
	10.2	972-nn012-21	972-nn012-31	972-nn022-22	—
	13.0	972-nn013-21	972-nn013-31	972-nn023-22	972-nn053-22
	15.7	972-nn026-21	972-nn026-31	—	—
	16.6	972-nn006-21	972-nn006-31	—	—
	17.5	972-nn018-21	972-nn018-31	—	—
	25.0	972-nn019-21	972-nn019-31	972-nn029-22	—



**Type:** Male connector 90°  
**Termination:** Press-fit  
**Number of contacts:** 2 - 108  
**Pitch:** 2.54 mm  
**Operational current:** 1.9 A  
**Approval:** **RoHS COMPLIANT**

Technical Specifications on page 184



**Accessories**

- Processing tools p. 340

**Mating connector / Application:**

VarPol Female connector (p. 186)



**Press-fit 1-row**

No. of contacts	Y	Termination length		
		Part number		
		Performance level II	Performance level III	
max. 36	1-row	2.8	981-nn010-21	981-nn010-31
		5.6	981-nn011-21	981-nn011-31
		7.8	981-nn012-21	981-nn012-31
		10.6	981-nn013-21	981-nn013-31

**Ordering note**

nn=no. of contacts/row  
 Example for pin header: 2-row,  
 100 contacts Performance level II,  
 length of termination side 3.4 mm,  
 length of mating side 5.6 mm ->  
**982-50011-21**

**Note**

Performance level II  
 = 250 mating cycles  
 Performance level III  
 = 50 mating cycles

**On request**

- special contact length
- other contact surface



**Press-fit 2-row**

No. of contacts	Y	Termination length		
		Part number		
		Performance level II	Performance level III	
max. 108	2-row	2.8	982-nn010-21	982-nn010-31
		5.6	982-nn011-21	982-nn011-31







Press-fit

No. of contacts		Surface	Termination length		
			Part number		
max. 32	1-row	5 µm Sn	930-61nn0	–	–
		0.25 µm Au	930-61nn4	930-66nn4	930-66nn5
max. 64	2-row	5 µm Sn	936-61nn0	–	–
		0.25 µm Au	936-61nn4	936-66nn4	936-66nn5

Ordering note

nn=no. of contacts/row  
Example for Socket connector:  
2-row, 28 contacts, 0.25 µm Au,  
15 mm termination length  
-> **936-66145**

Note

\*Rear mating zone Ni, Au

On request

- processing tools