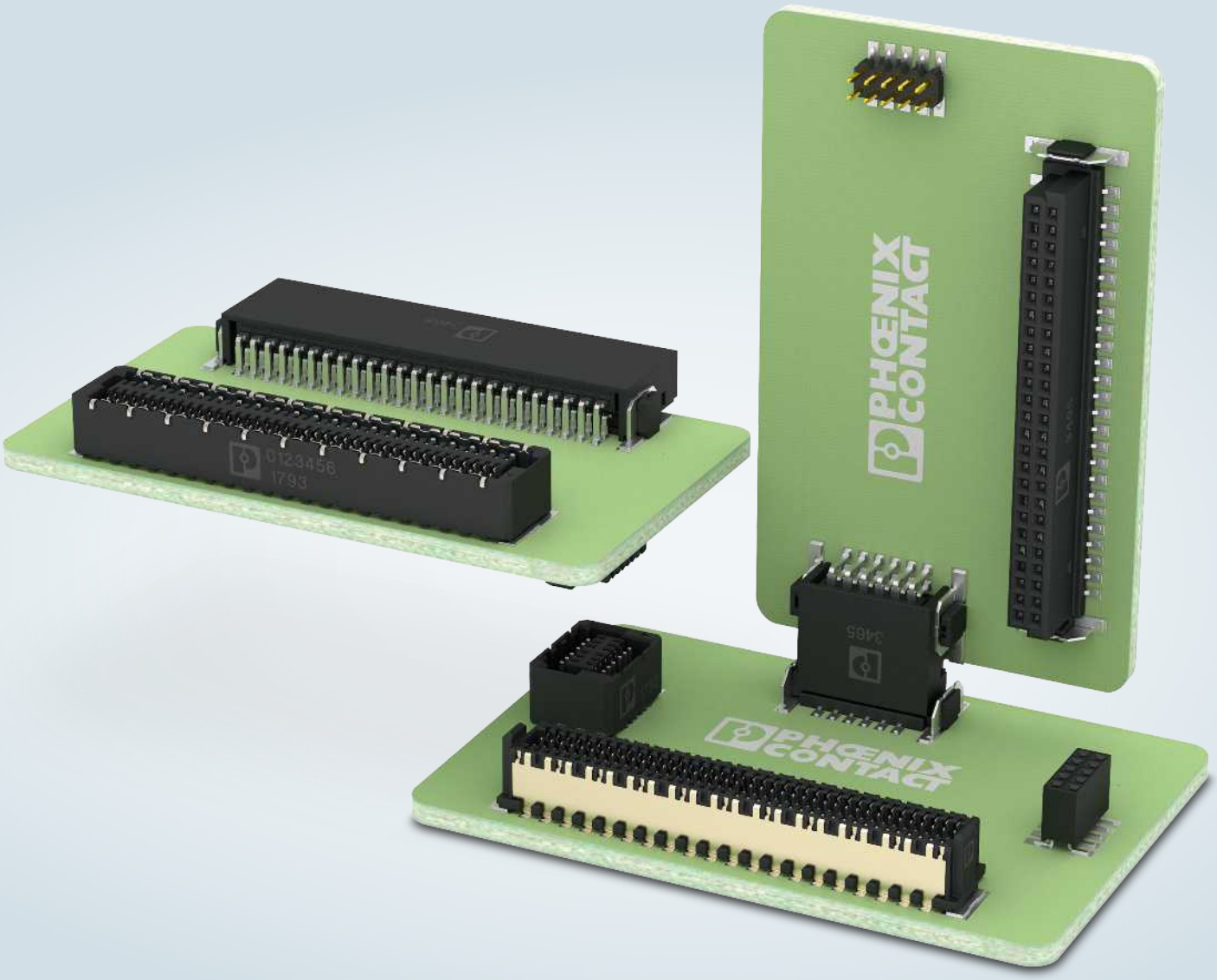


Board-to-board connectors

Product overview 2021

PHOENIX CONTACT
INSPIRING INNOVATIONS

Connectivity for all dimensions

With FP and FQ series board-to-board connectors, Phoenix Contact provides shielded and unshielded solutions for signal and data transmission in the device.

This allows you to realize individual PCB orientations with different, application-oriented designs, stack heights, and numbers of positions in compact 0.8 mm, 1.27 mm, and 2.54 mm pitches.

Web code: #2330

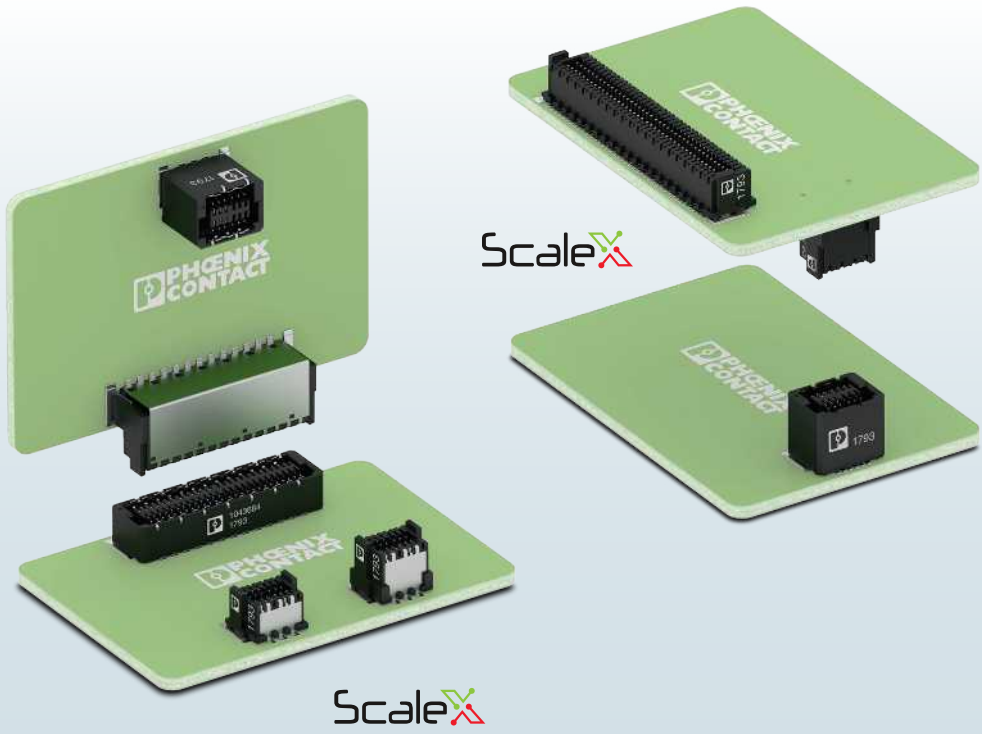
FP 0,8 unshielded

- Robust high-speed board-to-board connections
- 0.8 mm pitch
- High contact density from 12- to 80-pos.
- Suitable for automatic optical inspection (AOI) after reflow soldering
- Stack heights from 6 to 12 mm
- Data transmission up to 16 Gbps
- Automatic optical inspection (AOI) after reflow soldering

Web code: #2050

FP 0,8 shielded

- Robust high-speed board-to-board connections
- 0.8 mm pitch
- High contact density from 12- to 80-pos.
- Stack heights from 6 to 12 mm
- Data transmission up to 16 Gbps
- Shielding for excellent EMC properties



Web code: #1520

FP 1,27 unshielded

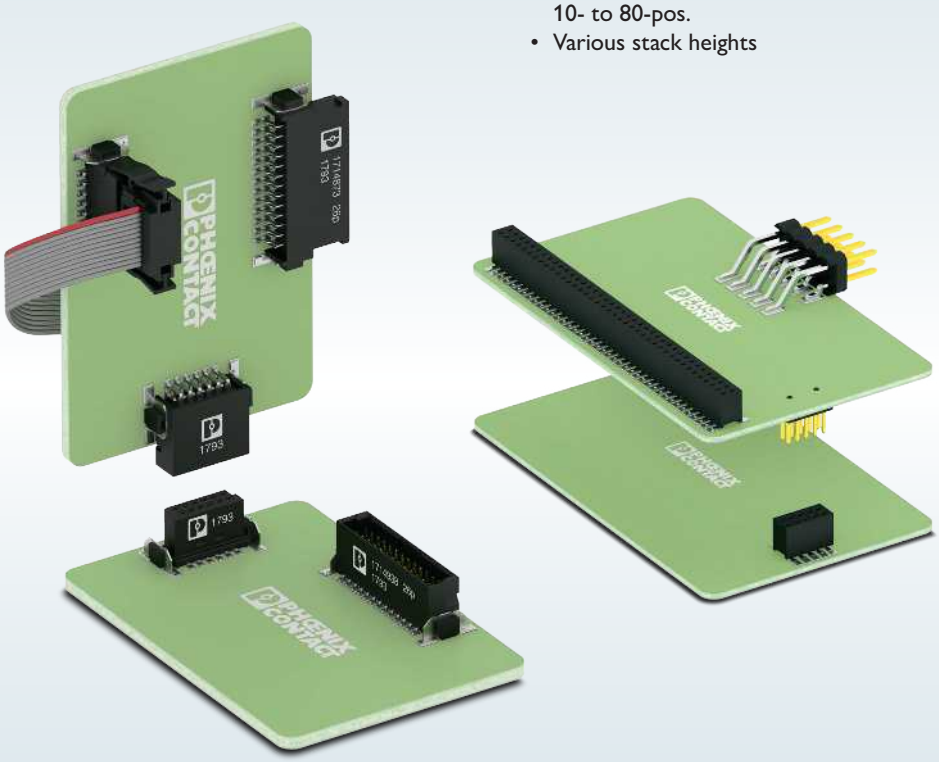
- Flexible board-to-board and wire-to-board connections
- 1.27 mm pitch
- High contact density from 12- to 80-pos.
- Stack heights from 8 to 13.8 mm

Web code: #2658

Web code: #2659

FQ 1,27 / FQ 2,54

- Flexible board-to-board connections
- 1.27 and 2.54 mm pitch
- High contact density from 10- to 80-pos.
- Various stack heights



Find out more with the web code

For detailed information, use the web codes provided in this brochure. Simply enter # and the four-digit number in the search field on our website.

Web code: #1234 (example)

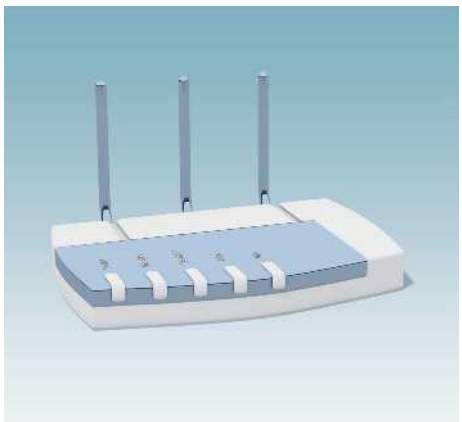
Or use the direct link:
phoenixcontact.net/webcode/#1234

Contents

The right connection for flexible device design

With its double-sided contact system, the high-position FINEPITCH series offers the ideal solution for industrial-grade PCB connections. You have maximum flexibility when it comes to arranging the PCBs in your device. The wide range of FINEPITCH products provides solutions for space-saving signal and data transmission. In addition, the shielded versions offer excellent EMC properties.

Web code: #2069

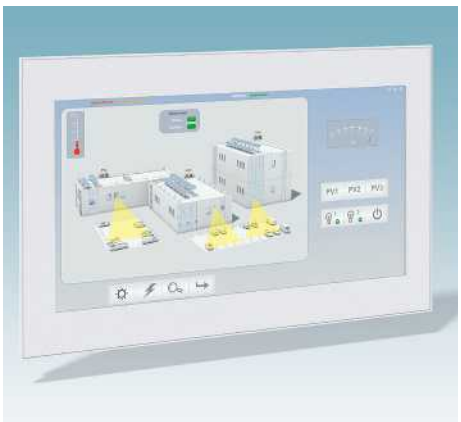


I/Os

PLCs

Frequency converters

Controllers



HMIs

Sensors

Robust connections, thanks to FP 0,8 with ScaleX technology

The double-sided ScaleX contact system of the FP 0,8 series enables particularly robust PCB connections. High-speed data rates up to 16 Gbps are supported. The shielding ensures excellent electromagnetic behavior. Extending the portfolio by designing horizontal versions has allowed for additional ways in which PCBs can be oriented in relation to one another – we have thus created a unique and flexible portfolio of unshielded and shielded board-to-board connectors.

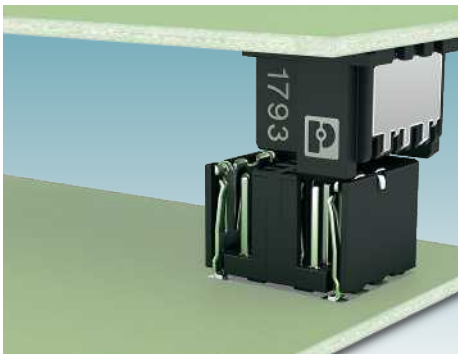
Further information about the FP 0,8 shielded series:

Web code: #2050

Further information about the FP 0,8 unshielded series:

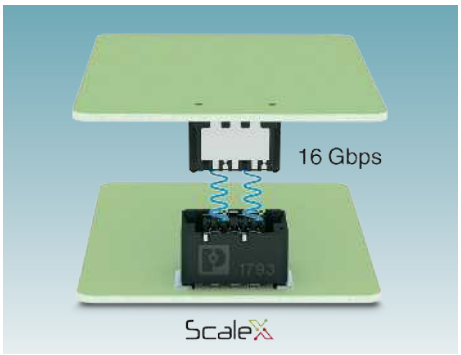
Web code: #2330

FP 0,8 series – advantages at a glance



Robust insertion with high tolerance compensation

The hermaphroditic double contact enables a housing geometry in which the contacts are protected.

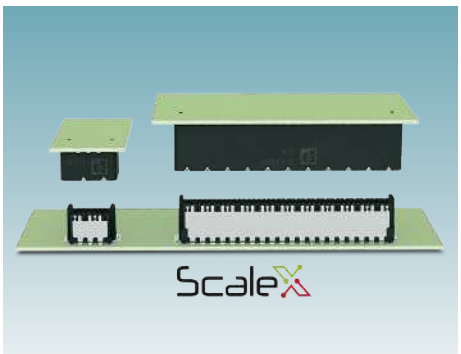


High data rate up to 16 Gbps

The FP 0,8 series provides excellent signal integrity.

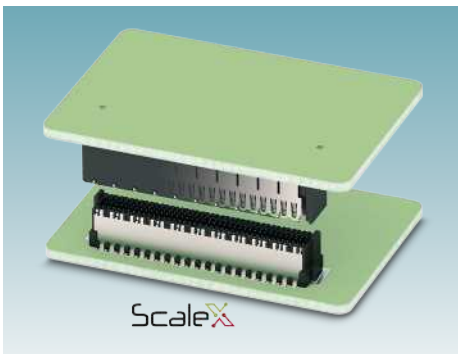
Reliable connection

The double contact enables a variable wipe length of 1.5 mm.



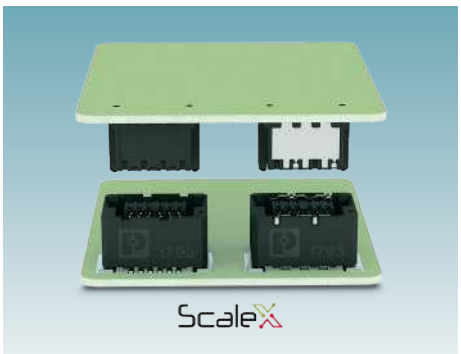
Flexible device design

Stack heights from 6 to 12 mm and versions planned for the future allow a great deal of freedom for the device design.



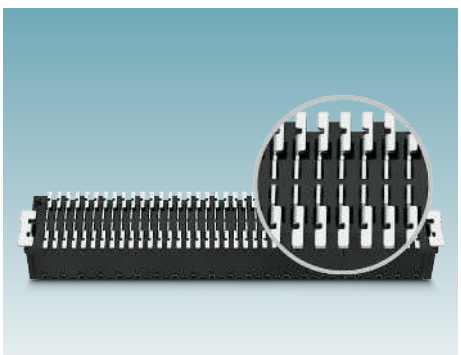
Additional protection with EMC shielding

The shielded versions have excellent protection against electromagnetic interference.



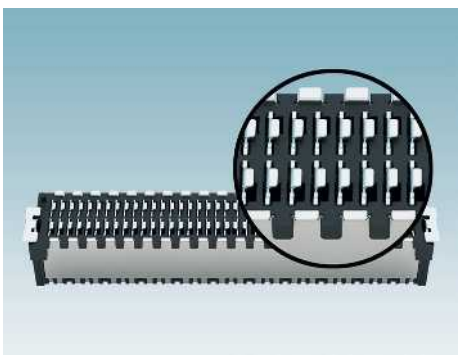
Maximum variability in just one range

Featuring the same tolerances, stack heights, and mechanical properties, the shielded and unshielded versions have been designed to suit a wide range of applications.



Automatic quality control

Unshielded contacts are routed under the housing, and enable automatic optical inspection (AOI).



Outstanding EMC protection

Shielded contacts are located underneath the component and are surrounded by the shield contacts. An inspection by means of CT scan is possible.

Automated processing

Coplanarity, tape-on-reel packaging, and pick-and-place pads enable automated reflow processes.

Innovative contact system

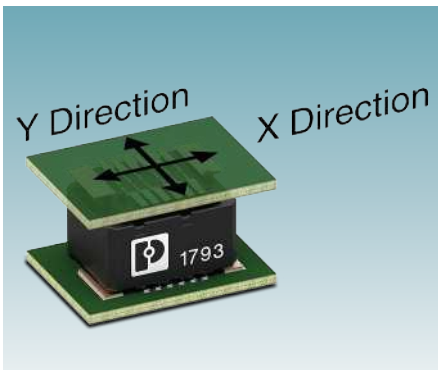
The FP 0,8 series with ScaleX technology features a unique double contact. The contacts are designed to be hermaphroditic and therefore consist of a male and a female element. This enables vibration-resistant connection in a very tight space. The contacts have gull-wing solder pins, which are ideal for automatic soldering processes.

Robustness

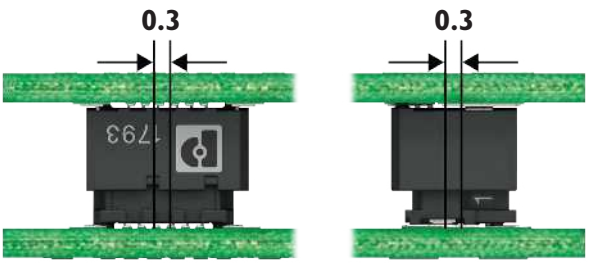
The robustness of the ScaleX technology is multi-faceted:

- The ScaleX contact system enables a housing geometry in which the contacts are protected against damage in the event of mismatching.
- The board-to-board connectors of the FP 0,8 series are designed to allow for tolerances when the components are set. Due to a tolerance to the nominal position of ±0.3 mm in the X and Y direction, it is possible to use several board-to-board connectors to connect two PCBs taking the usual setting tolerances into consideration. This reduces the otherwise typical strain on the soldering spots.
- The male and female connector strips are designed so that reliable mating is ensured, even when there is a center offset of ±0.7 mm and an angular deviation of 2° or 4°.

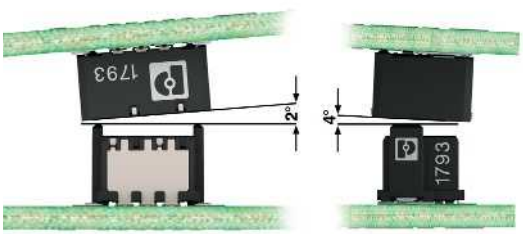
A high tolerance compensation is therefore possible for your application throughout the entire process chain.



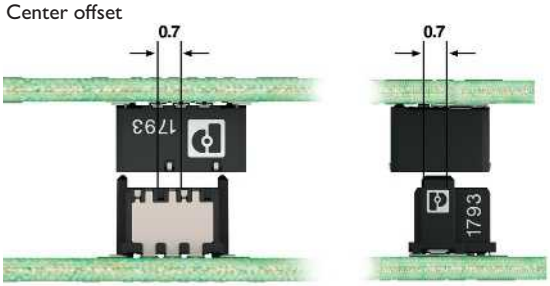
Setting tolerance



Inclination tolerance



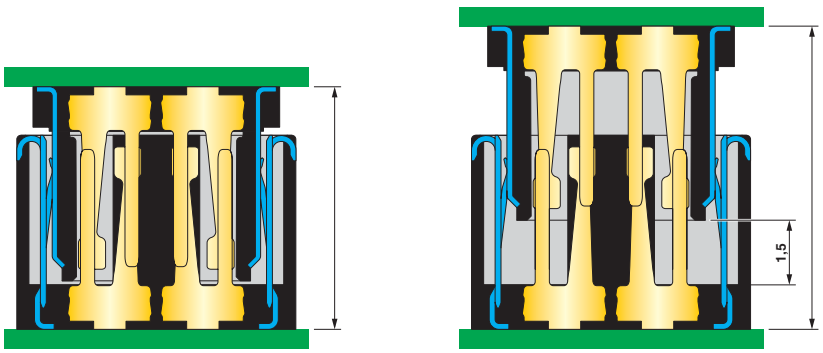
Center offset



Flexible device design

Thanks to the arrangement of vertical male and female connector strips, different stack heights can be implemented. The stack height describes the distance between two PCBs overlapping in parallel.
A range from 6 to 12 mm can be comprehensively covered using just two male and female connector strips. Within this range, the mating partners offer a variable wipe length of 1.5 mm.
The female connector strip is fully inserted into the male connector strip with the respective minimum PCB spacing. To achieve the respective maximum PCB spacing, 1.5 mm of the male contact remains outside the contact zone.
This minimizes product variance while simultaneously providing a high degree of flexibility for device design. We plan to extend the portfolio in the future to include stack heights up to 18 mm.

Stack height (mm)	Base height for male connector strip (mm)	Base height for female connector strip (mm)
6 to 7.5	1.15	4.85
7.5 to 9	2.65	4.85
9 to 10.5	1.15	7.85
10.5 to 12	2.65	7.85

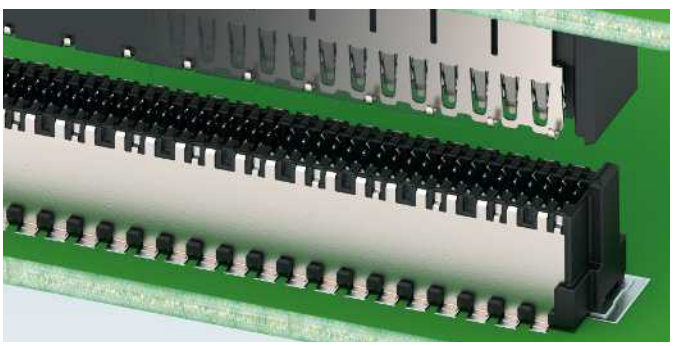


Minimum PCB spacing (left) and maximum PCB spacing (right), thanks to wipe length

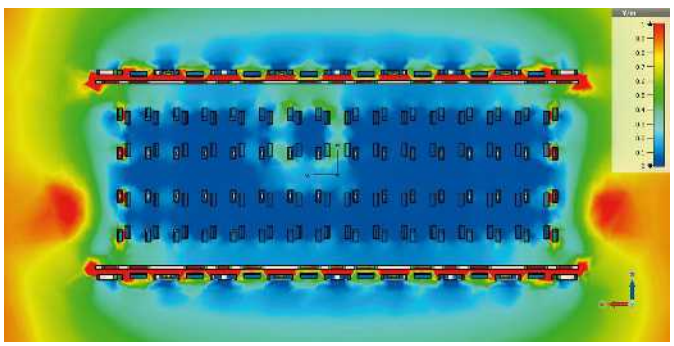
EMC shielding

The shielded FP 0,8 series has excellent electromagnetic compatibility (EMC). The shielded connectors are therefore suitable for applications with high EMC requirements. The numerous shield transition points from female to male connector strip ensure that interference currents are immediately discharged. A good solder connection also ensures continuous connection to the PCB. This provides shielding against interference signals.

The figure of the electrical field illustrates the shielding effect and depicts a very low coupling inductance in the connector when an interference signal is present at the shield. When both external contacts are connected to ground, optimal 360° shielding is achieved.



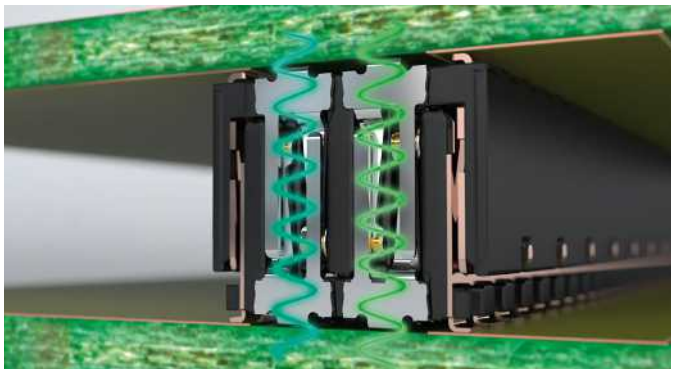
Shield transition from female to male connector strip



Electrical field

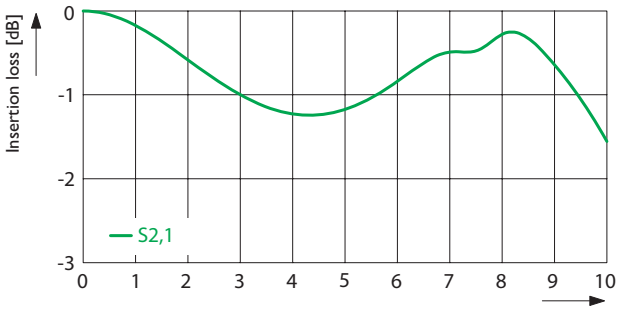
High-speed data transmission

The FP 0,8 series is particularly suitable for high-speed data transmission up to 16 Gbps. The ScaleX contact system has geometrically identical female and male contacts, thus enabling symmetrical data flow. Excellent signal integrity is achieved even at high frequencies up to 8 GHz.
The most common method of data transmission is to use differential pairs. The signals are transmitted by means of a contact pair, i.e., two adjacent contacts.



Insertion loss

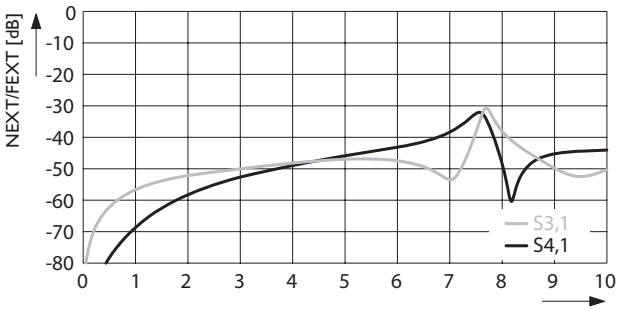
Insertion loss indicates the attenuation of the signal level during data transmission from the transmitter to the receiver. The damping behavior varies accordingly depending on whether the mating partner is fully inserted or protrudes by the wipe length of 1.5 mm.



FP 0,8/...-FV-SH 7,85 with FP 0,8/...-MV-SH 2,65, differential pair, 12 mm stack height

Crosstalk

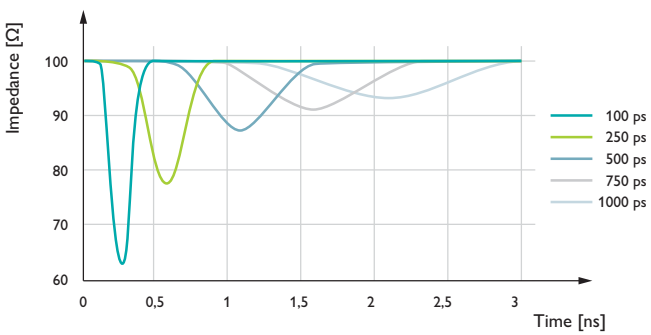
Crosstalk refers to the interference caused to data transmission on adjacent contacts. A distinction is made between near-end crosstalk (NEXT) on the transmitter side and far-end crosstalk (FEXT) on the receiver side. Crosstalk can be minimized by increasing the contact spacing and by assigning adjacent contacts as ground pins.



FP 0,8/...-FV-SH 7,85 with FP 0,8/...-MV-SH 2,65, differential pair, 12 mm stack height

Impedance

Impedance is a frequency-dependent resistance that occurs during data transmission. To avoid reflections, the impedances of the PCBs and the components installed on them must be coordinated.
The diagram on the right shows the impedance at various rise times. The rise time describes the time it takes for the voltage level to switch between 0 and 1. The smaller the cutout, the better the transmission quality.
S-parameters to support the design-in process are available on request.



FP 0,8/…-FV-SH 7,85 with FP 0,8/…-MV-SH 2,65, differential pair, 12 mm stack height

FP 0,8 – technical data

General technical data		Standards
Pitch	0.8 mm	
Number of positions	12, 20, 32, 52, 80	
EMC properties	shielded/unshielded	
Data transmission speed	up to 16 Gbps	
Nominal current, 52-pos. (at 20°C)	1.7 A (per contact)	IEC 60512-5-2:2002
Insulation resistance	Min. 5 GΩ	IEC 60512-3-1:2002
Contact resistance	Max. 20 mΩ	IEC 60512-2-1:2002
Test voltage	500 V AC	IEC 60512-4-1:2003
Air clearances and creepage distances	Min. 0.25 mm	
Temperature limits during operation	-55°C to +125°C	
Insertion and withdrawal force per contact	≤1.2 N	
Approval	UL 1977	
Environmental and durability tests		
Service life	500 insertion cycles, performance level I	IEC 60512-9-1:2010
Oscillation, sinusoidal	10 ... 2000 Hz, 20 g	IEC 60512-6-4:2002
Contact interference during oscillation, sinusoidal	<1 µs	IEC 60512-2-5:2003
Shocks, half-sinusoidal	50 g, 11 ms	IEC 60512-6-3:2002
Contact interference during shocks, half-sinusoidal	<1 µs	IEC 60512-2-5:2003
Information on metal parts		
Note	WEEE/RoHS-compliant, free of whiskers	IEC 60068-2-82/JEDEC JESD 201
Live metal parts	Cu alloy	
Surface of contact area	Ni, Au	
Surface of soldering area	Sn	
Information on insulation material		
Insulation material and group	LCP, IIIa	
Color	Black	
Resistance to creepage	CTI 150	DIN EN 60112 (VDE 0303-11)
Flammability rating in accordance with UL 94	V0	
Processing note		
Process	SMD soldering	In accordance with IPC/JEDEC J-STD-020D.1:2008-03
Moisture sensitivity level	MSL 1	
Coplanarity	≤0.1 mm	
Packaging	Tape-on-reel	

FP 0,8 – product overview

Web code: #2050

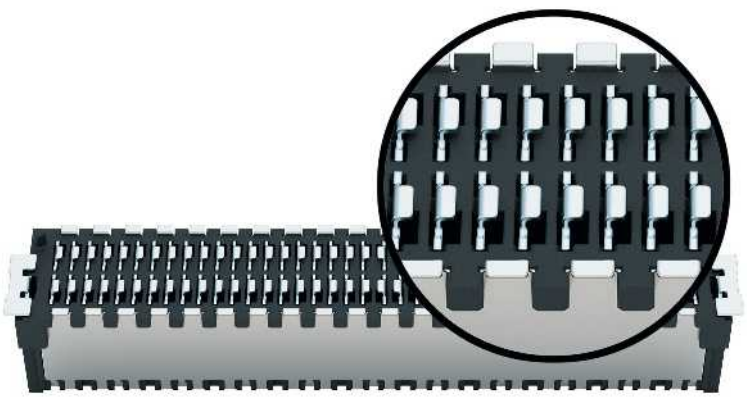
Shielded

	Vertical male connector strip				Vertical female connector strip			
								
No. of pos.	**Installed height 1.15 mm**		**Installed height 2.65 mm**		**Installed height 4.85 mm**		**Installed height 7.85 mm**	
	Type	**Order No.**	**Type**	**Order No.**	**Type**	**Order No.**	**Type**	**Order No.**
12	FP 0.8/ 12-MV-SH 1.15	1043786	FP 0,8/ 12-MV-SH 2,65	1043731	FP 0.8/ 12-FV-SH 4.85	1043710	FP 0,8/ 12-FV-SH 7,85	1043682
20	FP 0.8/ 20-MV-SH 1.15	1053586	FP 0,8/ 20-MV-SH 2,65	1053609	FP 0,8/ 20-FV-SH 4,85	1053612	FP 0,8/ 20-FV-SH 7,85	1053614
32	FP 0,8/ 32-MV-SH 1,15	1043787	FP 0,8/ 32-MV-SH 2,65	1043733	FP 0,8/ 32-FV-SH 4,85	1043711	FP 0,8/ 32-FV-SH 7,85	1043683
52	FP 0.8/ 52-MV-SH 1.15	1043789	FP 0,8/ 52-MV-SH 2,65	1043756	FP 0,8/ 52-FV-SH 4,85	1043713	FP 0,8/ 52-FV-SH 7,85	1043684
80	FP 0,8/ 80-MV-SH 1,15	1043790	FP 0,8/ 80-MV-SH 2,65	1043757	FP 0,8/ 80-FV-SH 4,85	1043714	FP 0,8/ 80-FV-SH 7,85	1043685

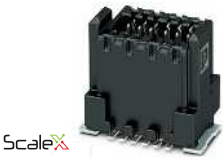
	Horizontal male connector strip		Horizontal female connector strip	
				
No. of pos.	**Type**	**Order No.**	**Type**	**Order No.**
12	FP 0,8/ 12-MH-SH	1043791	FP 0,8/ 12-FH-SH	1043722
20	FP 0,8/ 20-MH-SH	1053615	FP 0,8/ 20-FH-SH	1053616
32	FP 0,8/ 32-MH-SH	1043792	FP 0,8/ 32-FH-SH	1043723
52	FP 0,8/ 52-MH-SH	1043793	FP 0,8/ 52-FH-SH	1043724
80	FP 0,8/ 80-MH-SH	1043794	FP 0,8/ 80-FH-SH	1043725

Design of the solder contacts

The signal contacts are located underneath the component and are surrounded by the shield contacts. When both external contacts are connected to ground, optimal 360° shielding is achieved. A CT scan can be performed to assess the soldering results for the signal contacts.



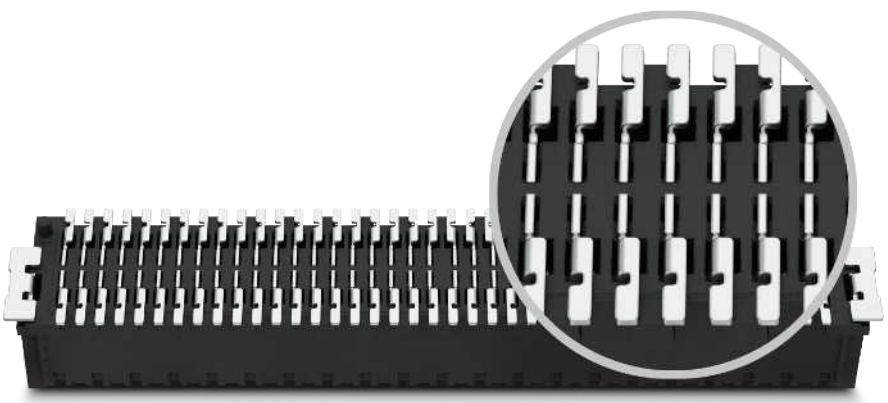
Unshielded

	Vertical male connector strip				Vertical female connector strip			
								
No. of pos.	**Installed height 1.15 mm**		**Installed height 2.65 mm**		**Installed height 4.85 mm**		**Installed height 7.85 mm**	
	Type	**Order No.**	**Type**	**Order No.**	**Type**	**Order No.**	**Type**	**Order No.**
12	FP 0,8/ 12-MV 1,15	1061725	FP 0,8/ 12-MV 2,65	1061696	FP 0,8/ 12-FV 4,85	1061643	FP 0,8/ 12-FV 7,85	1061580
20	FP 0,8/ 20-MV 1,15	1061727	FP 0,8/ 20-MV 2,65	1061697	FP 0,8/ 20-FV 4,85	1061660	FP 0,8/ 20-FV 7,85	1061583
32	FP 0,8/ 32-MV 1,15	1061728	FP 0,8/ 32-MV 2,65	1061698	FP 0,8/ 32-FV 4,85	1061662	FP 0,8/ 32-FV 7,85	1061584
52	FP 0,8/ 52-MV 1,15	1061729	FP 0,8/ 52-MV 2,65	1061700	FP 0,8/ 52-FV 4,85	1061666	FP 0,8/ 52-FV 7,85	1061585
80	FP 0,8/ 80-MV 1,15	1061730	FP 0,8/ 80-MV 2,65	1061704	FP 0,8/ 80-FV 4,85	1061667	FP 0,8/ 80-FV 7,85	1061586

	Horizontal male connector strip		Horizontal female connector strip	
				
No. of pos.	**Type**	**Order No.**	**Type**	**Order No.**
12	FP 0,8/ 12-MH	1104548	FP 0,8/ 12-FH	1104540
20	FP 0,8/ 20-MH	1104549	FP 0,8/ 20-FH	1104541
32	FP 0,8/ 32-MH	1104550	FP 0,8/ 32-FH	1104542
52	FP 0,8/ 52-MH	1104551	FP 0,8/ 52-FH	1104543
80	FP 0,8/ 80-MH	1104552	FP 0,8/ 80-FH	1104544

Design of the solder contacts

The signal contacts are routed under the housing, and thus enable automatic optical inspection (AOI).



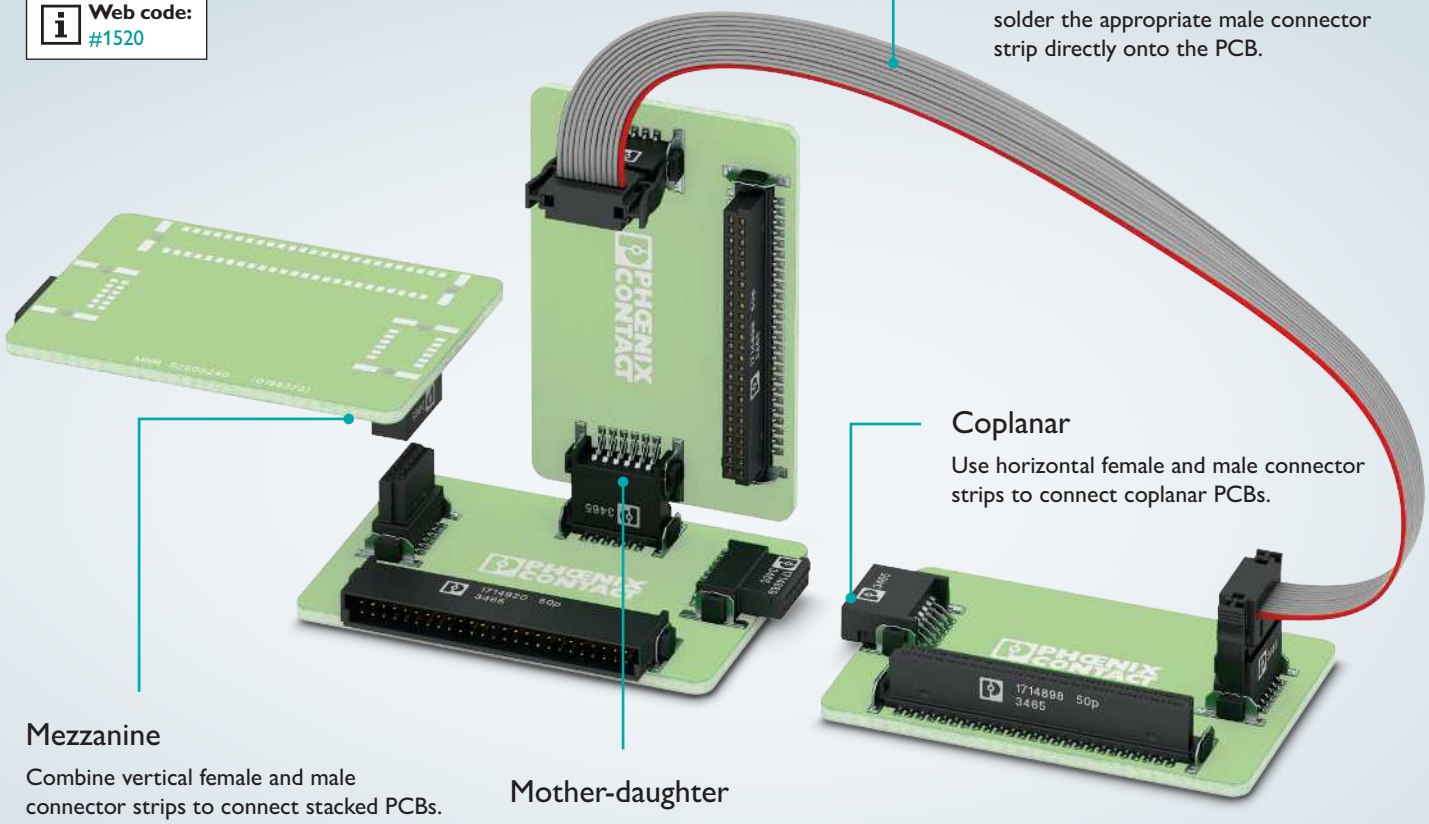
Flexibility for your device design with FINEPITCH 1,27

FP 1,27 series board-to-board connectors offer versatile solutions for the connection of several PCBs within the device. Horizontal and vertical male and female connector strips enable application-specific arrangements – with assembled flat-ribbon cables for wire-to-board applications available on request.

Web code: #1520

Flat-ribbon cable

You can use a flat-ribbon cable and pre-assembled female connector strips with IDC connection to establish flexible connections between two PCBs. You can solder the appropriate male connector strip directly onto the PCB.



Coplanar

Use horizontal female and male connector strips to connect coplanar PCBs.

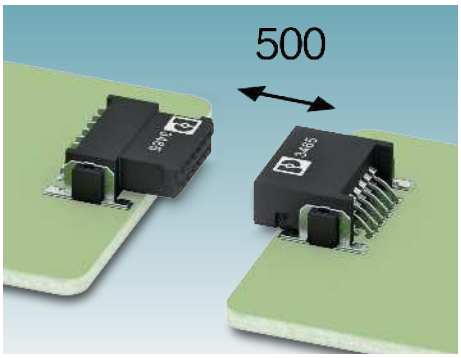
Mezzanine

Combine vertical female and male connector strips to connect stacked PCBs. Various heights enable PCB spacing of 8 mm to 13.8 mm.

Mother-daughter

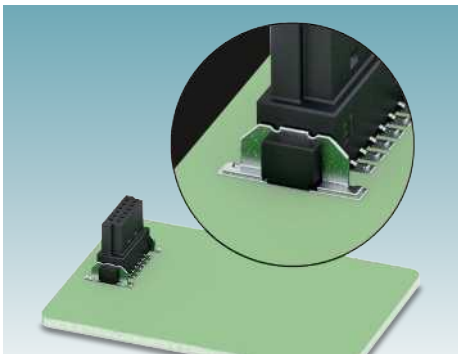
If you combine vertical and horizontal designs, a right-angled connection is established between two PCBs. Male and female connector strips are available in both designs.

FP 1,27 series – advantages at a glance



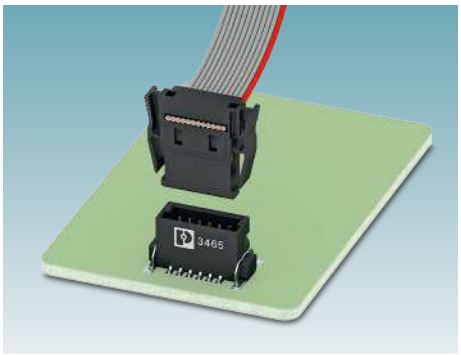
Continuously reliable contact

The gold-plated contact surface enables up to 500 insertion and withdrawal cycles, performance level 1.



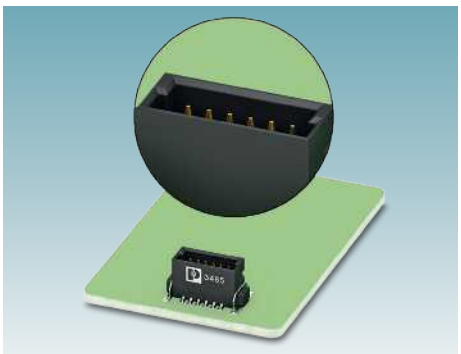
Stable soldering

Anchor metals ensure that the connection to the PCB is mechanically stable.



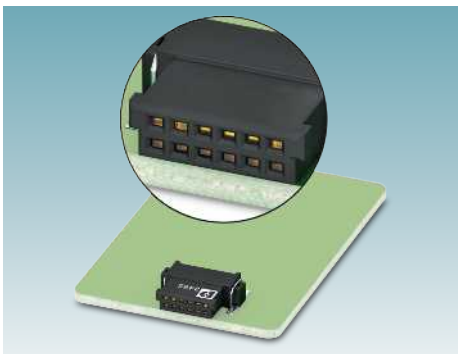
Protection from vibrations

Latching on both sides prevents connections from coming loose due to vibrations.



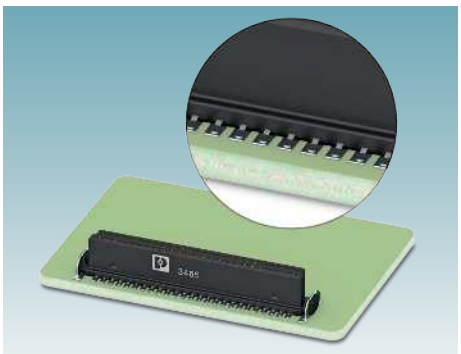
Reliable connection

Lead-in chamfers ensure that male and female connector strips are guided and engage correctly.



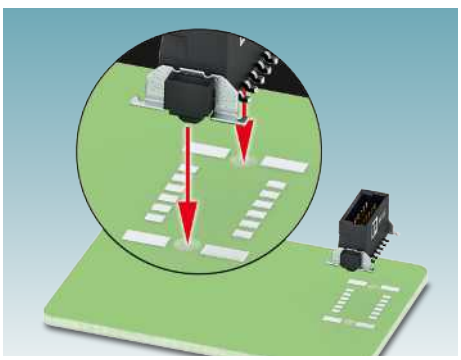
Mismatching prevented

Polarization prevents female and male connector strips from being rotated 180° before being connected to each other.



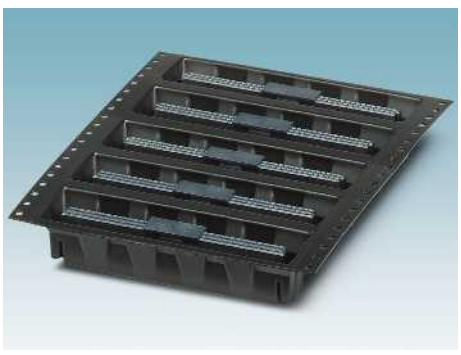
Process-reliable soldering

Female and male connector strips feature a coplanarity of ≤0.1 mm.



Securely positioned

Positioning pins on the bottom ensure secure positioning on the PCB.



Process-compatible packaging

The female and male connector strips are supplied in tape-on-reel packing, connectors without cables are supplied in tray format, and pre-assembled connectors are supplied in a bag.

Automated soldering

The PCB connectors are soldered using the SMT method. Overhead soldering and Automatic Optical Inspection (AOI) are also possible.

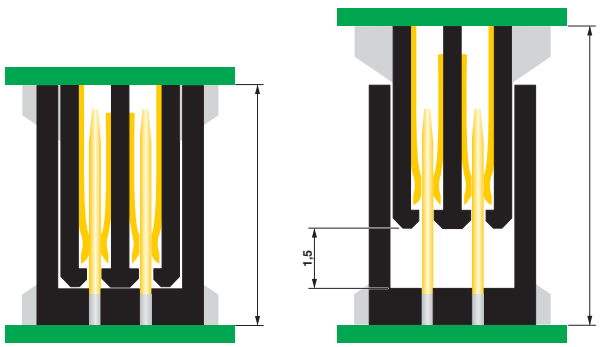
FP 1,27 series – installation instructions

Stack heights

The stack height describes the distance between two PCBs overlapping in parallel. You can use vertical versions of the female and male connector strips to reliably connect PCBs. Thanks to their wipe length of 1.5 mm, the PCB connectors are ideal for a continuous range of stack heights between 8 mm and 13.8 mm.

The female connector strip is fully inserted into the male connector strip with the respective minimum PCB spacing. To achieve the respective maximum PCB spacing, 1.5 mm of the male contact remains outside the contact zone. This ensures reliable contact overlapping of at least 0.9 mm at all times.

Stack height (mm)	Base height for male connector strip (mm)	Base height for female connector strip (mm)
8.0 to 9.5	1.75	6.25
9.5 to 11.0	3.25	6.25
10.8 to 12.3	1.75	9.05
12.3 to 13.8	3.25	9.05

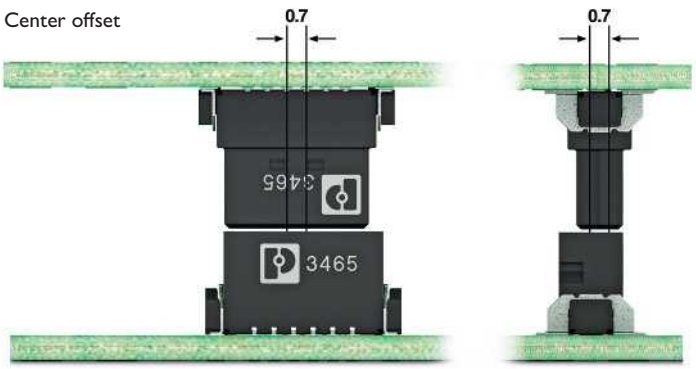


Minimum PCB spacing (left) and maximum PCB spacing (right), thanks to wipe length

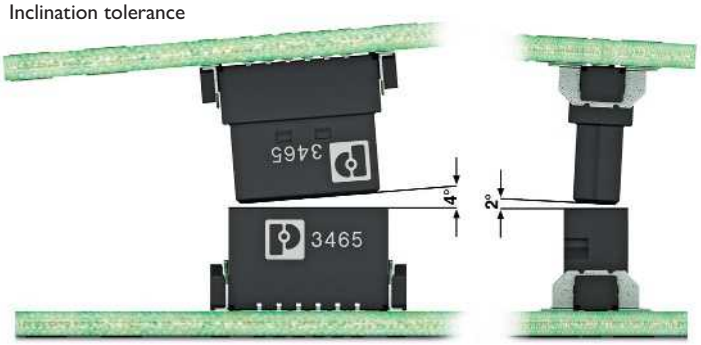
Center offset and inclination tolerance

Female and male connector strips are designed so that reliable mating is ensured, even with a center offset of up to ±0.7 mm. A deviation of ±4° is permitted for longitudinal angles, and a deviation of ±2° for oblique angles. This geometry allows tolerances in the mounting process for robust applications.

Center offset



Inclination tolerance



FP 1,27 series – technical data

General technical data		Standards
Pitch	1.27 mm	
Number of positions	12, 16, 20, 26, 32, 40, 50, 68, 80	
Nominal current (at 20°C)	1.4 A (50-pos.)	IEC 60512-5-2:2002
Insulation resistance	Min. 10 GΩ	IEC 60512-3-1:2002
Contact resistance	Max. 25 mΩ	IEC 60512-2-1:2002
Test voltage	500 V AC	IEC 60512-4-1:2003
Air clearances and creepage distances	Min. 0.4 mm	
Temperature limits during operation	-55°C to +125°C	
Insertion and withdrawal force per contact	approx. 0.5 N	
Approval	UL 1977	
Environmental and durability tests		
Service life	500 insertion cycles, performance level I	IEC 60512-9-1:2010
Oscillation, sinusoidal	10 ... 2000 Hz, 20 g	IEC 60512-6-4:2002
Contact interference during oscillation, sinusoidal	<1 µs	IEC 60512-2-5:2003
Shocks, half-sinusoidal	50 g, 11 ms	IEC 60512-6-3:2002
Contact interference during shocks, half-sinusoidal	<1 µs	IEC 60512-2-5:2003
Information on metal parts		
Note	WEEE/RoHS-compliant, free of whiskers	IEC 60068-2-82/JEDEC JESD 201
Live metal parts	Cu alloy	
Surface of contact area	Ni, PdNi, Au and Ni, NiP Au	
Surface of soldering area	Sn	
Information on insulation material		
Insulation material and group	LCP, IIIa	
Resistance to creepage	CTI 175	DIN EN 60112 (VDE 0303-11)
Flammability rating in accordance with UL 94	V0	
Processing note		
Process	SMD soldering	In accordance with IPC/JEDEC J-STD-020D.1:2008-03
Moisture sensitivity level	MSL 1	
Coplanarity	≤0.1 mm	
Connection capacity of IDC female connector strip		
Pitch of flat-ribbon cable	0.635 mm	
Standard cable type	PVC	
Conductor cross section AWG/kcmil	30/7	
Contact resistance of IDC female connector strip	Max. 10 mΩ	

FP 1,27 series – product overview: Female connector strips

Web code: #1520

Vertical female connector strip

Number of positions	Installed height: 6.25 mm		Installed height: 9.05 mm	
	Type	Order No.	Type	Order No.
12	FP 1,27/ 12-FV 6,25	1714891	FP 1,27/ 12-FV 9,05	1714999
16	FP 1,27/ 16-FV 6,25	1714892	FP 1,27/ 16-FV 9,05	1715000
20	FP 1,27/ 20-FV 6,25	1714893	FP 1,27/ 20-FV 9,05	1714881
26	FP 1,27/ 26-FV 6,25	1714894	FP 1,27/ 26-FV 9,05	1714882
32	FP 1,27/ 32-FV 6,25	1714895	FP 1,27/ 32-FV 9,05	1714884
40	FP 1,27/ 40-FV 6,25	1714897	FP 1,27/ 40-FV 9,05	1714885
50	FP 1,27/ 50-FV 6,25	1714898	FP 1,27/ 50-FV 9,05	1714886
68	FP 1,27/ 68-FV 6,25	1714899	FP 1,27/ 68-FV 9,05	1714888
80	FP 1,27/ 80-FV 6,25	1714901	FP 1,27/ 80-FV 9,05	1714889

Horizontal female connector strip

No. of pos.	Type	Order No.
12	FP 1,27/ 12-FH	1714869
16	FP 1,27/ 16-FH	1714871
20	FP 1,27/ 20-FH	1714872
26	FP 1,27/ 26-FH	1714873
32	FP 1,27/ 32-FH	1714875
40	FP 1,27/ 40-FH	1714877
50	FP 1,27/ 50-FH	1714878
68	FP 1,27/ 68-FH	1714879
80	FP 1,27/ 80-FH	1714880

IDC female connector strip

No. of pos.	Type	Order No.
12	FP 1,27/ 12-FWL	1714902
16	FP 1,27/ 16-FWL	1714903
20	FP 1,27/ 20-FWL	1714904
26	FP 1,27/ 26-FWL	1714905
32	FP 1,27/ 32-FWL	1714907
40	FP 1,27/ 40-FWL	1714908
50	FP 1,27/ 50-FWL	1714909
68	FP 1,27/ 68-FWL	1714910
80	FP 1,27/ 80-FWL	1714911

Note

IDC female connector strips are available pre-assembled as standard. IDC female connector strips are also available separately; the processing information for assembly must be strictly observed. This information can be found on the detailed product page on our website at: phoenixcontact.com

FP 1,27 series – product overview: Male connector strips

Web code: #1520

Vertical male connector strip				
Number of positions	Installed height: 1.75 mm		Installed height: 3.25 mm	
	Type	Order No.	Type	Order No.
12	FP 1,27/ 12-MV 1,75	1714934	FP 1,27/ 12-MV 3,25	1714924
16	FP 1,27/ 16-MV 1,75	1714936	FP 1,27/ 16-MV 3,25	1714925
20	FP 1,27/ 20-MV 1,75	1714937	FP 1,27/ 20-MV 3,25	1714927
26	FP 1,27/ 26-MV 1,75	1714938	FP 1,27/ 26-MV 3,25	1714928
32	FP 1,27/ 32-MV 1,75	1714940	FP 1,27/ 32-MV 3,25	1714929
40	FP 1,27/ 40-MV 1,75	1714941	FP 1,27/ 40-MV 3,25	1714930
50	FP 1,27/ 50-MV 1,75	1714943	FP 1,27/ 50-MV 3,25	1714931
68	FP 1,27/ 68-MV 1,75	1714944	FP 1,27/ 68-MV 3,25	1714932
80	FP 1,27/ 80-MV 1,75	1714945	FP 1,27/ 80-MV 3,25	1714933

Horizontal male connector strip		
No. of pos.	Type	Order No.
12	FP 1,27/ 12-MH	1714912
16	FP 1,27/ 16-MH	1714914
20	FP 1,27/ 20-MH	1714915
26	FP 1,27/ 26-MH	1714916
32	FP 1,27/ 32-MH	1714917
40	FP 1,27/ 40-MH	1714918
50	FP 1,27/ 50-MH	1714920
68	FP 1,27/ 68-MH	1714921
80	FP 1,27/ 80-MH	1714923

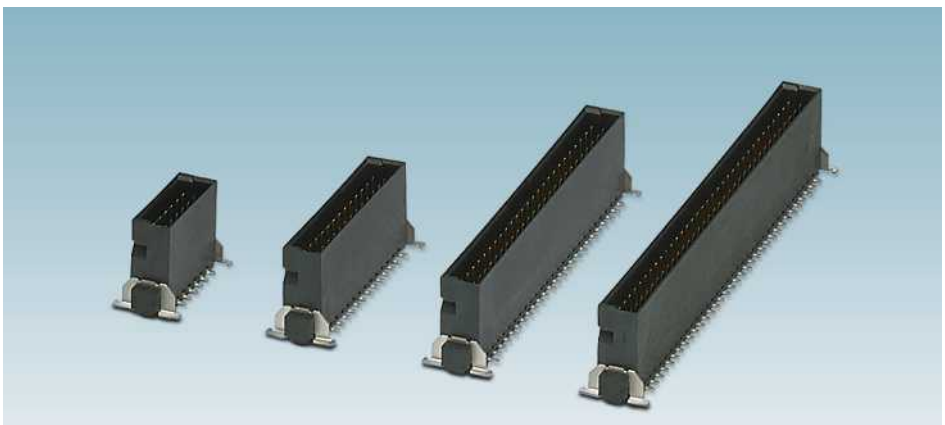
High degree of flexibility

Providing the number of positions match, any male connector strip can be combined with any female connector strip. The high-position PCB connectors with 1.27 mm pitch are compatible with the layouts and connections of existing systems on the market.

Number of positions

The double-row board-to-board connectors are available with the following number of positions: 12, 16, 20, 26, 32, 40, 50, 68, and 80. The number of positions corresponds to the total number of contacts.

Example: A 12-position item has six contacts per row. On all FP 1,27 series products, position 1 is marked as a1.



Various numbers of positions from 12 to 80

FP 1,27 series – assembled IDC female connector strip

Configure your IDC female connector strips in four steps

The following designation key helps you configure a flexible flat-ribbon cable connection between two PCBs. Select the following:
1. The desired number of positions
2. The appropriate assembly variant
3. The flat-ribbon cable material
4. The desired cable length

The designation key summarizes this information and is used as the individual order number for your configuration.
The color-coded wire (in this case, red) is on the same side as the position 1 marking on the connector.
Individual cable assemblies are available with a minimum order quantity of 500 units.

Designation key:

					1.								2.			3.		4.	
F	**P**	**1**	**,**	**2**	**7**	**/**	**...**	**-**	**F**	**W**	**L**	**-**	**...**	**...**	**/**	**...**	**/**	**...**	
Fine	Pitch	Pitch					**No. of pos.**		Female con. strip/ male con.	Wire/ cable	Locking/ latching flange		**Assembly variant**			**Type of flat-ribbon cable**		**Length**	
							12						1	0		P		0.05 to 0.95 m	
							16						1	1		T			
							20						1	2					
							26						2	0					
							32						2	1					
							40												
							50												
							68												
							80												

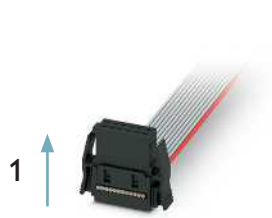
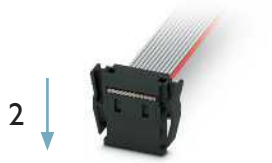
Cable type

The PVC flat-ribbon cable is available as standard (type P flat-ribbon cable).
Cross section: AWG 30/0.06 mm²
Litz wire: Cu litz wire, tin-plated, 7 x 0.102 mm
Pitch: 0.635 mm
Contact resistance: max. 10 mΩ

The cable length can be between 0.05 and 0.95 m. Configuration is also possible in 5 cm increments.

Key	Cable type	Operating temperature	Coded wire	Comment
P	PVC	-10°C ... +105°C (-30°C at rest)	Red	Standard
T	TPE-S resistant to high temperatures	-40°C ... +125°C (-60°C at rest)	Green	On request

Configurable PCB connectors with 1.27 mm pitch

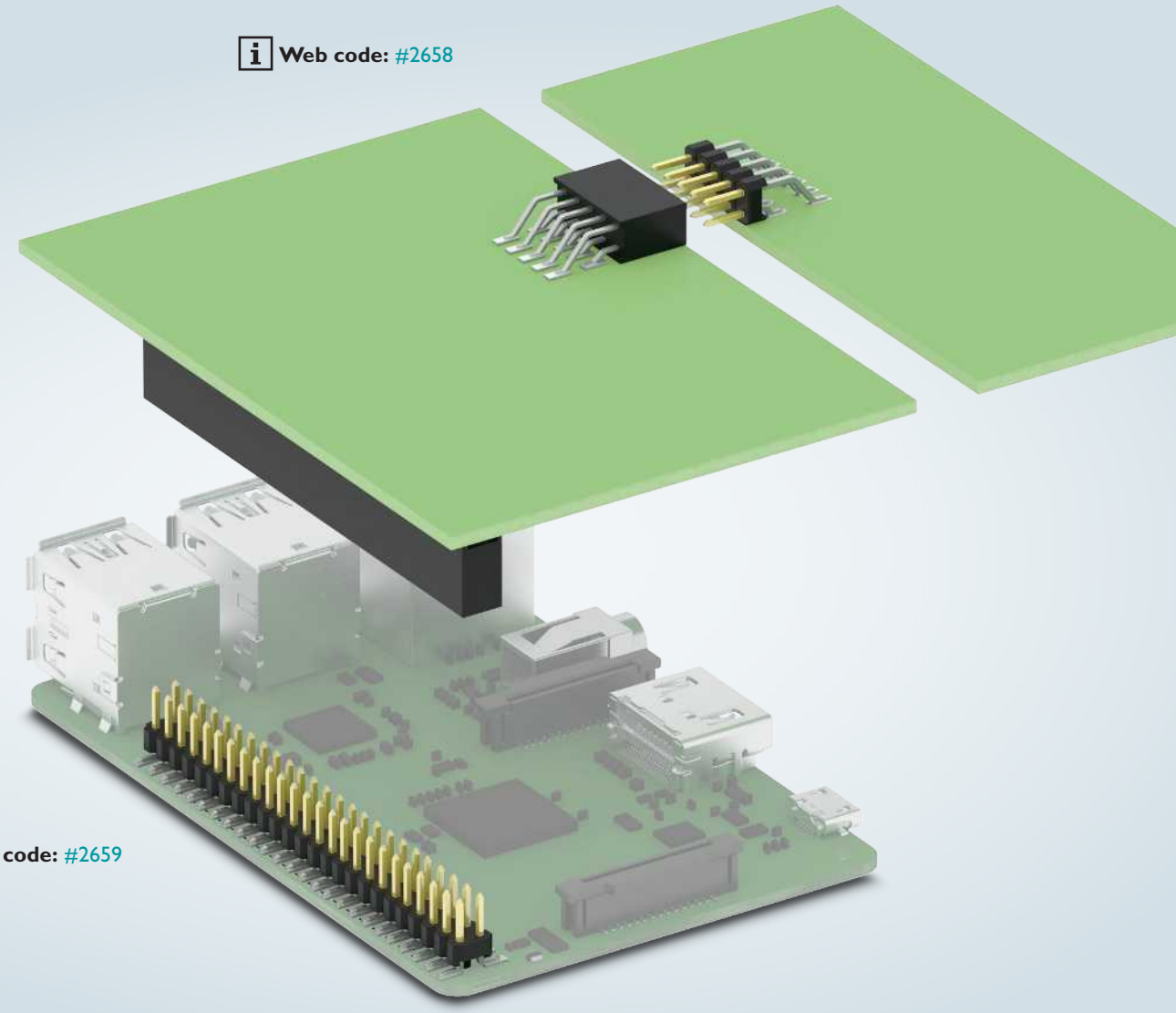
Assembly variants	Number of positions	Order designation	Order No.	Type of flat-ribbon cable	Length (m)
Assembly variant 10 	12	FP 1,27/ 12-FWL-10/…/…	1010259	P	0.05 to 0.95
	16	FP 1,27/ 16-FWL-10/…/…	1010258	P	0.05 to 0.95
	20	FP 1,27/ 20-FWL-10/…/…	1010257	P	0.05 to 0.95
	26	FP 1,27/ 26-FWL-10/…/…	1010256	P	0.05 to 0.95
	32	FP 1,27/ 32-FWL-10/…/…	1010255	P	0.05 to 0.95
	40	FP 1,27/ 40-FWL-10/…/…	1010246	P	0.05 to 0.95
	50	FP 1,27/ 50-FWL-10/…/…	1010254	P	0.05 to 0.95
	68	FP 1,27/ 68-FWL-10/…/…	1010253	P	0.05 to 0.95
	80	FP 1,27/ 80-FWL-10/…/…	1010252	P	0.05 to 0.95
Assembly variant 11 	12	FP 1,27/ 12-FWL-11/…/…	1010580	P	0.05 to 0.95
	16	FP 1,27/ 16-FWL-11/…/…	1010251	P	0.05 to 0.95
	20	FP 1,27/ 20-FWL-11/…/…	1010250	P	0.05 to 0.95
	26	FP 1,27/ 26-FWL-11/…/…	1010248	P	0.05 to 0.95
	32	FP 1,27/ 32-FWL-11/…/…	1010247	P	0.05 to 0.95
	40	FP 1,27/ 40-FWL-11/…/…	1010581	P	0.05 to 0.95
	50	FP 1,27/ 50-FWL-11/…/…	1010245	P	0.05 to 0.95
	68	FP 1,27/ 68-FWL-11/…/…	1010244	P	0.05 to 0.95
	80	FP 1,27/ 80-FWL-11/…/…	1010243	P	0.05 to 0.95
Assembly variant 12 	12	FP 1,27/ 12-FWL-12/…/…	1010242	P	0.05 to 0.95
	16	FP 1,27/ 16-FWL-12/…/…	1010241	P	0.05 to 0.95
	20	FP 1,27/ 20-FWL-12/…/…	1010240	P	0.05 to 0.95
	26	FP 1,27/ 26-FWL-12/…/…	1010239	P	0.05 to 0.95
	32	FP 1,27/ 32-FWL-12/…/…	1010238	P	0.05 to 0.95
	40	FP 1,27/ 40-FWL-12/…/…	1010237	P	0.05 to 0.95
	50	FP 1,27/ 50-FWL-12/…/…	1010236	P	0.05 to 0.95
	68	FP 1,27/ 68-FWL-12/…/…	1010235	P	0.05 to 0.95
	80	FP 1,27/ 80-FWL-12/…/…	1010234	P	0.05 to 0.95
Assembly variant 20 	12	FP 1,27/ 12-FWL-20/…/…	1010233	P	0.05 to 0.95
	16	FP 1,27/ 16-FWL-20/…/…	1010232	P	0.05 to 0.95
	20	FP 1,27/ 20-FWL-20/…/…	1010231	P	0.05 to 0.95
	26	FP 1,27/ 26-FWL-20/…/…	1010230	P	0.05 to 0.95
	32	FP 1,27/ 32-FWL-20/…/…	1010229	P	0.05 to 0.95
	40	FP 1,27/ 40-FWL-20/…/…	1010228	P	0.05 to 0.95
	50	FP 1,27/ 50-FWL-20/…/…	1010224	P	0.05 to 0.95
	68	FP 1,27/ 68-FWL-20/…/…	1010221	P	0.05 to 0.95
	80	FP 1,27/ 80-FWL-20/…/…	1010220	P	0.05 to 0.95
Assembly variant 21 	12	FP 1,27/ 12-FWL-21/…/…	1010218	P	0.05 to 0.95
	16	FP 1,27/ 16-FWL-21/…/…	1010215	P	0.05 to 0.95
	20	FP 1,27/ 20-FWL-21/…/…	1010212	P	0.05 to 0.95
	26	FP 1,27/ 26-FWL-21/…/…	1010211	P	0.05 to 0.95
	32	FP 1,27/ 32-FWL-21/…/…	1010210	P	0.05 to 0.95
	40	FP 1,27/ 40-FWL-21/…/…	1010204	P	0.05 to 0.95
	50	FP 1,27/ 50-FWL-21/…/…	1010202	P	0.05 to 0.95
	68	FP 1,27/ 68-FWL-21/…/…	1010200	P	0.05 to 0.95
	80	FP 1,27/ 80-FWL-21/…/…	1010180	P	0.05 to 0.95

Assembly variant and number of positions = order designation and order number, type of flat-ribbon cable and length can be designed for assembly

Universal pin headers and sockets with 1.27 and 2.54 mm pitch

FQ series board-to-board connectors can be used universally. They are characterized by their application-oriented and cost-optimized design. The pin headers and sockets with 1.27 and 2.54 mm pitch enable mezzanine, coplanar, and mother-daughter connections to be implemented.

Web code: #2658



Web code: #2659

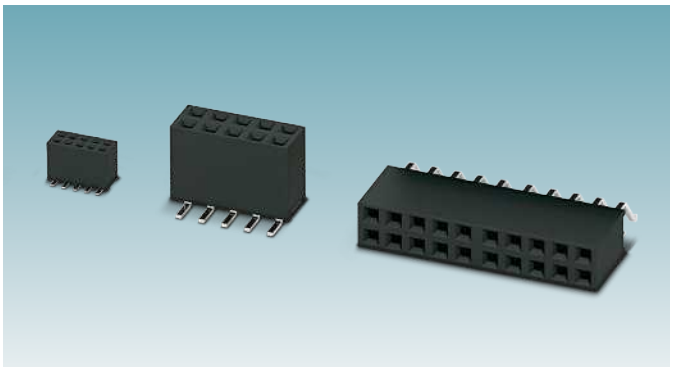
Technical data

General technical data	FQ 1,27	FQ 2,54	Standards
Pitch	1.27 mm	2.54 mm	
Number of positions	10, 20, 30, 50, 80	10, 20, 30, 50, 80	
Nominal current, 80-pos. (at 20°C)	1 A (per contact)	3 A (per contact)	IEC 60512-5-2:2002
Insulation resistance	Min. 1 GΩ	Min. 1 GΩ	IEC 60512-3-1:2002
Contact resistance	Max. 20 mΩ	Max. 20 mΩ	IEC 60512-2-1:2002
Test voltage	500 V AC	500 V AC	IEC 60512-4-1:2003
Air clearances and creepage distances	Min. 0.25 mm	Min. 0.40 mm	
Temperature limits during operation	-40°C to +125°C	-40°C to +125°C	
Insertion and withdrawal force per contact	≤1.2 N	≤2.9 N	
Approval	UL in preparation	UL in preparation	
Environmental and durability tests			
Service life	100 insertion cycles	100 insertion cycles	IEC 60512-9-1:2010
Oscillation, sinusoidal	10 Hz ... 55 Hz, 1.52 mm peak amplitude	10 Hz ... 55 Hz, 1.52 mm peak amplitude	IEC 60512-6-4:2002
Contact interference during oscillation, sinusoidal	≤1 µs	≤1 µs	IEC 60512-2-5:2003
Information on metal parts			
Note	WEEE/RoHS-compliant	WEEE/RoHS-compliant	
Live metal parts	Cu alloy	Cu alloy	
Surface of contact area	Ni, Au	Ni, Au	
Surface of soldering area	Sn	Sn	
Information on insulation material			
Insulation material and group	PA, I	PA, I	
Color	Black	Black	
Resistance to creepage	CTI ≥600	CTI ≥600	DIN EN 60112 (VDE 0303-11)
Flammability rating in accordance with UL 94	V0	V0	
Processing note			
Process	SMD soldering	SMD soldering	In accordance with IPC/JEDEC J-STD-020D.1:2008-03
Moisture sensitivity level	MSL 1	MSL 1	
Coplanarity	≤0.1 mm	Max. ≤0.15 mm (depending on the number of positions)	
Packaging	Tape-on-reel	Tube	

FQ 1,27 / FQ 2,54 series installation instructions

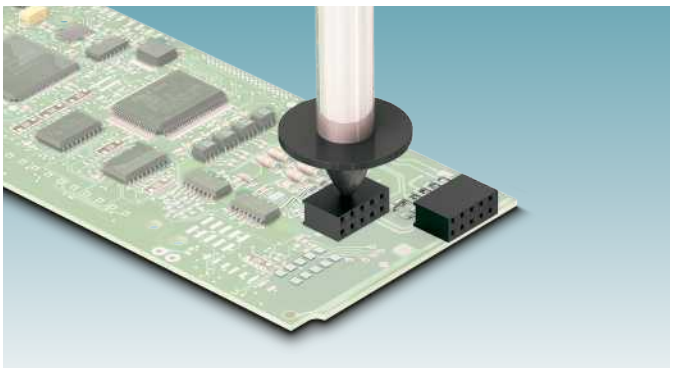
High degree of flexibility

Various pitches, numbers of positions, and designs allow a great deal of freedom for the device design. You can implement stack heights from 6.5 to 7.5 mm (FQ 1,27) or 14.0 to 14.9 mm (FQ 2,54). We plan to extend the portfolio in the future to include additional stack heights.



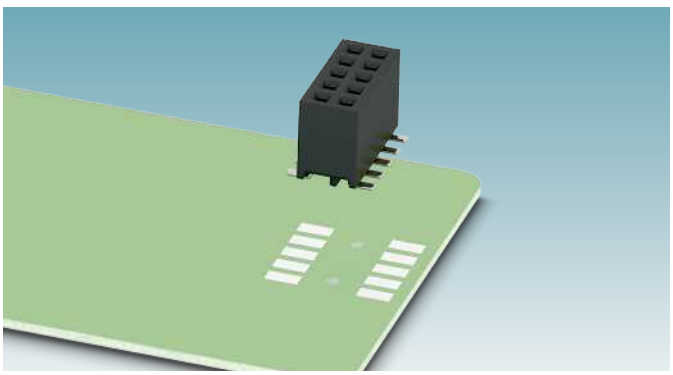
Automated processability

The connectors of the FQ 1,27 series are supplied in tape-on-reel packaging, while the items of the FQ 2,54 series are packaged in a box magazine. All items have suitable suction surfaces and additional pick-and-place pads.



Securely positioned

Positioning pins on the bottom ensure secure positioning on the PCB.



Automatic quality control

The PCB connectors are soldered using the SMT method. The soldering contacts are routed under the housing and enable automatic optical inspection (AOI).

FQ 1,27 / FQ 2,54 series product overview

FQ 1,27

	Vertical pin header		Vertical socket	
				
No. of pos.	**Type**	**Order No.**	**Type**	**Order No.**
10	FQ 1,27D/ 10-PV- 160-1-BR	1156861	FQ 1,27D/ 10-SV- 490-1-BR	1156833
20	FQ 1,27D/ 20-PV- 160-1-BR	1156862	FQ 1,27D/ 20-SV- 490-1-BR	1156835
30	FQ 1,27D/ 30-PV- 160-1-BR	1156863	FQ 1,27D/ 30-SV- 490-1-BR	1156838
50	FQ 1,27D/ 50-PV- 160-1-BR	1156864	FQ 1,27D/ 50-SV- 490-1-BR	1156839
80	FQ 1,27D/ 80-PV- 160-1-BR	1156865	FQ 1,27D/ 80-SV- 490-1-BR	1156842

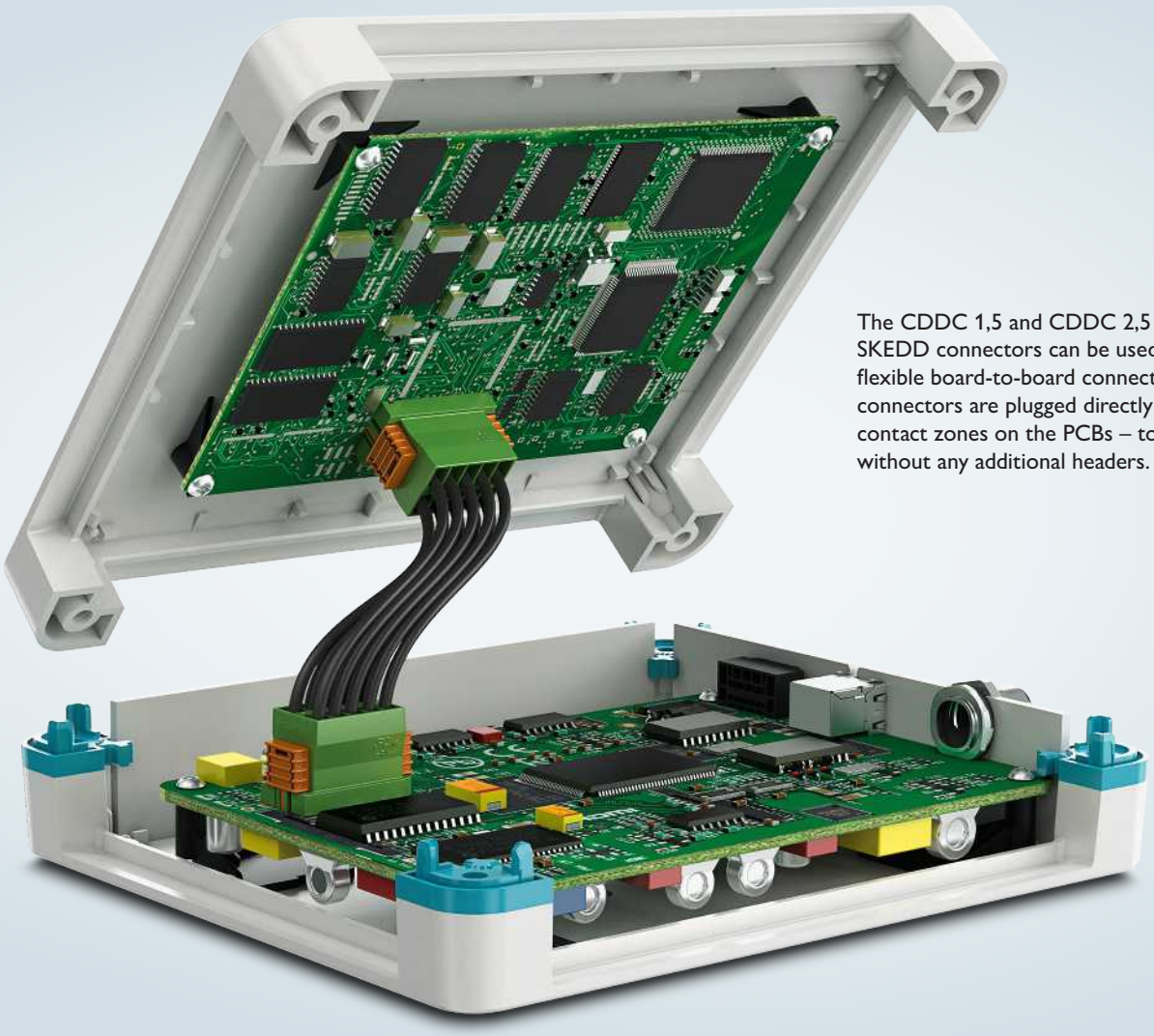
FQ 2,54

	Vertical pin header		Vertical socket	
				
No. of pos.	**Type**	**Order No.**	**Type**	**Order No.**
10	FQ 2,54D/ 10-PV- 380-1-BT	1156914	FQ 2,54D/ 10-SV-1020-1-BT	1156886
20	FQ 2,54D/ 20-PV- 380-1-BT	1156915	FQ 2,54D/ 20-SV-1020-1-BT	1156888
30	FQ 2,54D/ 30-PV- 380-1-BT	1156917	FQ 2,54D/ 30-SV-1020-1-BT	1156889
50	FQ 2,54D/ 50-PV- 380-1-BT	1156918	FQ 2,54D/ 50-SV-1020-1-BT	1156891
80	FQ 2,54D/ 80-PV- 380-1-BT	1156921	FQ 2,54D/ 80-SV-1020-1-BT	1156893
	Horizontal pin header		**Horizontal socket**	
				
No. of pos.	**Type**	**Order No.**	**Type**	**Order No.**
10	FQ 2,54D/ 10-PH-1-BT	1156939	FQ 2,54D/ 10-SH-0-BT	1156901
20	FQ 2,54D/ 20-PH-1-BT	1156942	FQ 2,54D/ 20-SH-0-BT	1156904
30	FQ 2,54D/ 30-PH-1-BT	1156943	FQ 2,54D/ 30-SH-0-BT	1156905
50	FQ 2,54D/ 50-PH-1-BT	1156944	FQ 2,54D/ 50-SH-0-BT	1156906
80	FQ 2,54D/ 80-PH-1-BT	1156945	FQ 2,54D/ 80-SH-0-BT	1156907

Implement additional PCB connections with the COMBICON portfolio

In addition to FINEPITCH series board-to-board connectors, the extensive COMBICON product portfolio also offers numerous connectors for implementing PCB connections: from special connectors for flexible LED PCBs through to connectors with 15 mm pitch for currents up to 125 A (IEC) per contact.

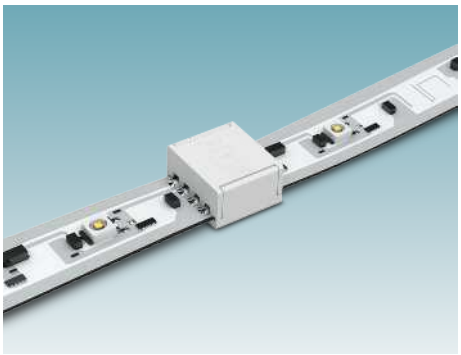
Web code: #2053



The CDDC 1,5 and CDDC 2,5 pre-assembled SKEDD connectors can be used to implement flexible board-to-board connections. The connectors are plugged directly into prepared contact zones on the PCBs – tool-free and without any additional headers.

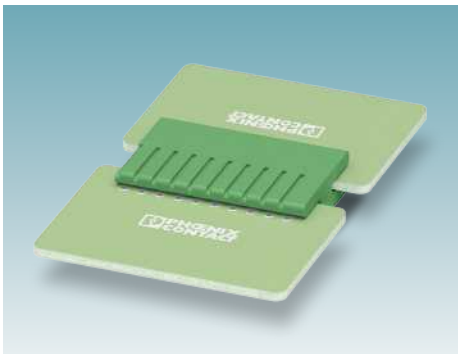
Overview of the product series

Web code: #0425



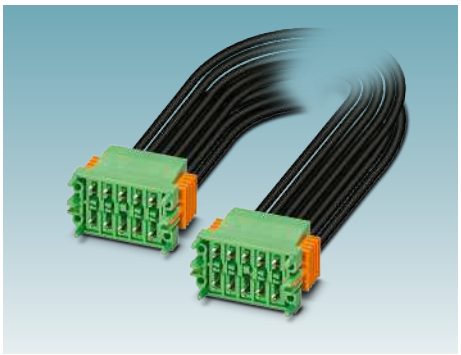
PTF 0,3

PCB connectors for direct plug-in for connecting flexible LED strips with a width of 8 or 10 mm.



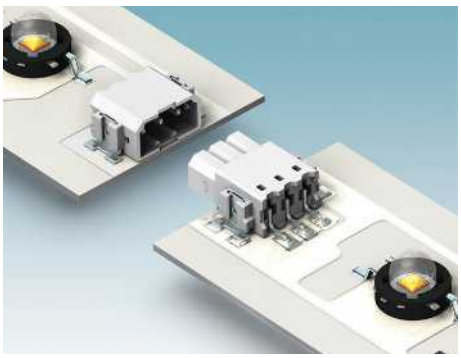
ZEC 1,0 / 1,5

PCB connectors for direct plug-in with 3.5, 5.0, and 7.5 mm pitch for currents up to 10 A per contact.



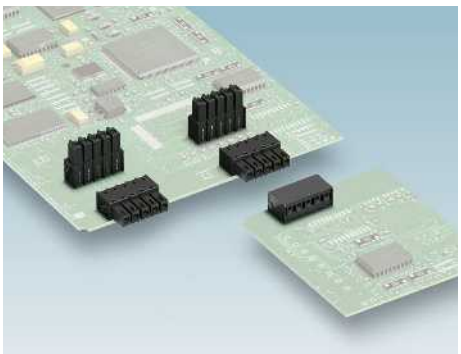
CDDC 1,5 / 2,5

Pre-assembled PCB connectors for direct plug-in with 3.5 and 5.0 mm pitch for currents up to 12 A per contact.



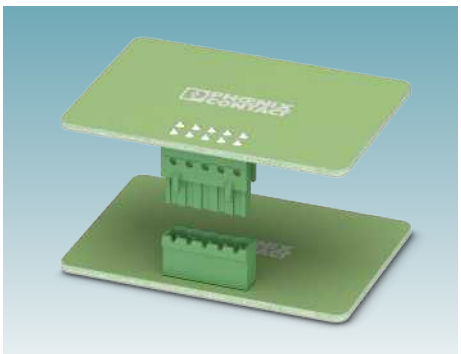
PTSM 0,5

THR and SMD PCB connectors with 2.5 mm pitch for currents up to 6 A per contact.



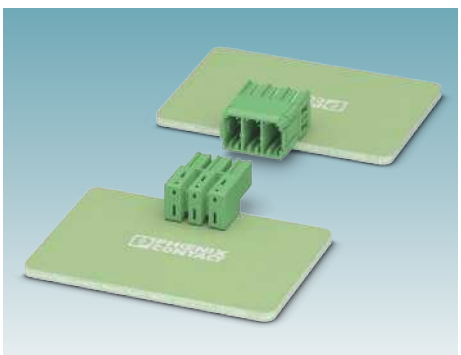
MC 1,5

PCB connectors with 3.5 and 3.81 mm pitch for currents up to 8 A per contact for THR and wave soldering.



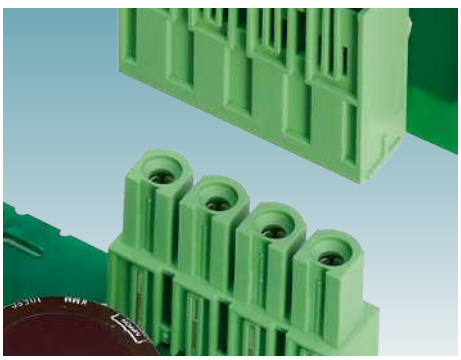
MSTB 2,5

PCB connectors with 5.08 and 7.62 mm pitch for currents up to 16 A per contact for wave soldering.



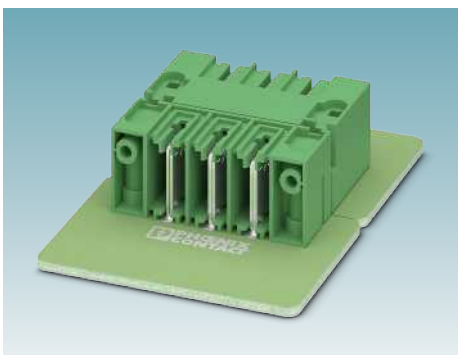
PC 5

PCB connectors with 7.62 mm pitch for currents up to 41 A per contact for wave soldering.



PC 16

PCB connectors with 10.16 mm pitch for currents up to 76 A per contact for wave soldering.



PC 35

PCB connectors with 15 mm pitch for currents up to 125 A per contact for wave soldering.

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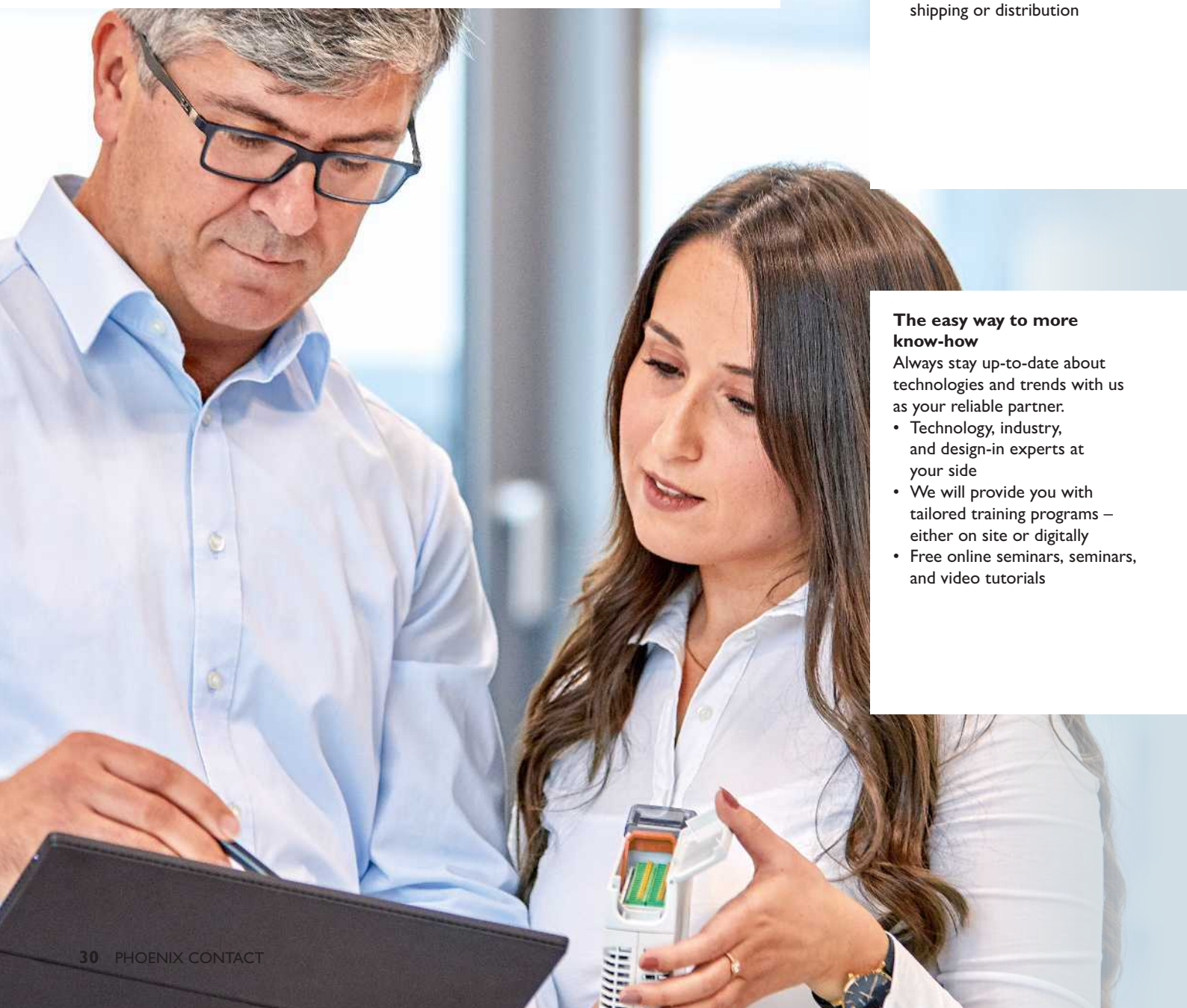

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