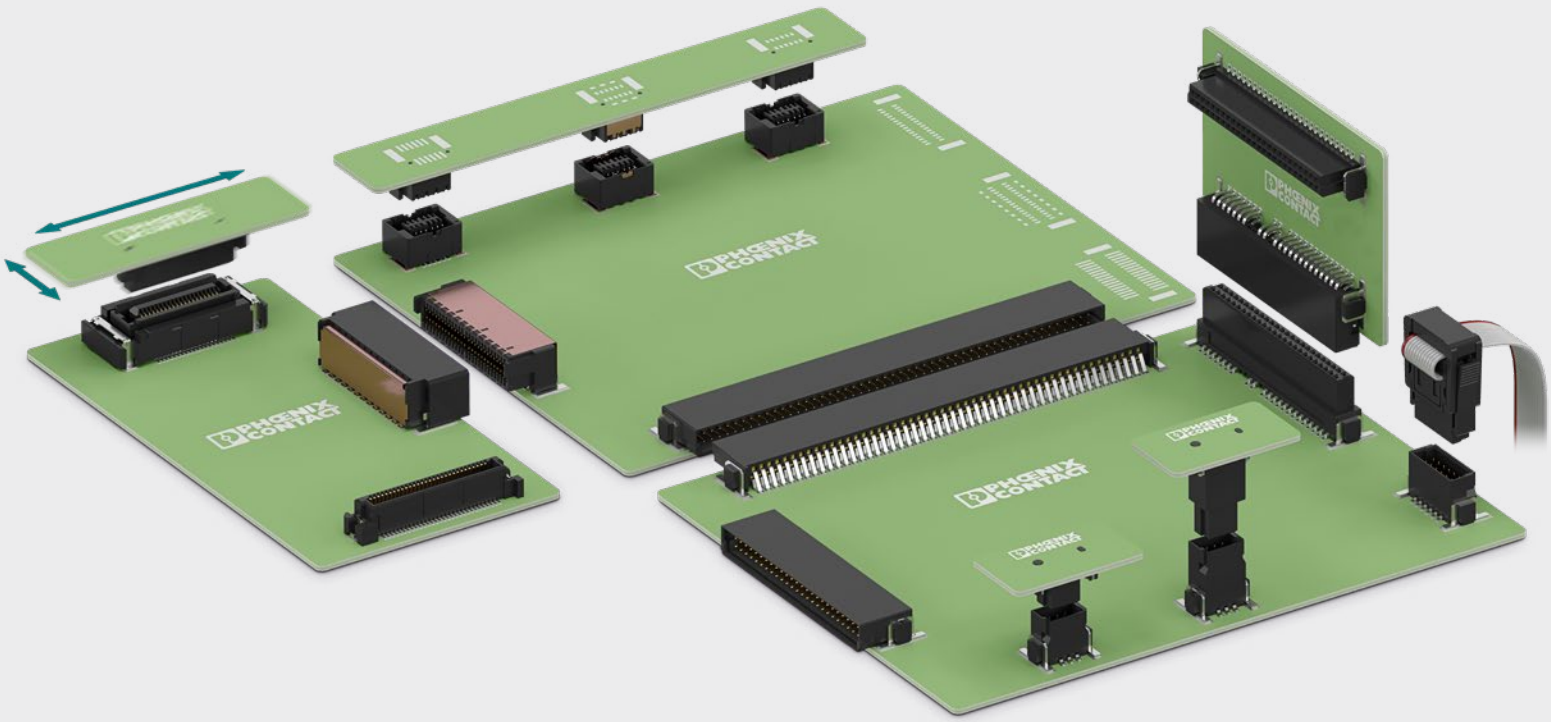


FINEPITCH
Board-to-board connectors

Product overview 2026

Connectivity for all dimensions

With its FS, FP, and FR series board-to-board connectors, Phoenix Contact provides shielded and unshielded solutions for signal and data transmission in devices.

This allows you to realize individual PCB orientations with different, application-oriented designs, stack heights, and numbers of positions with pitches of 0.635 mm, 0.8 mm, and 1.27 mm.



Web code: #3465



Web code: #3491

FS 0,635 unshielded

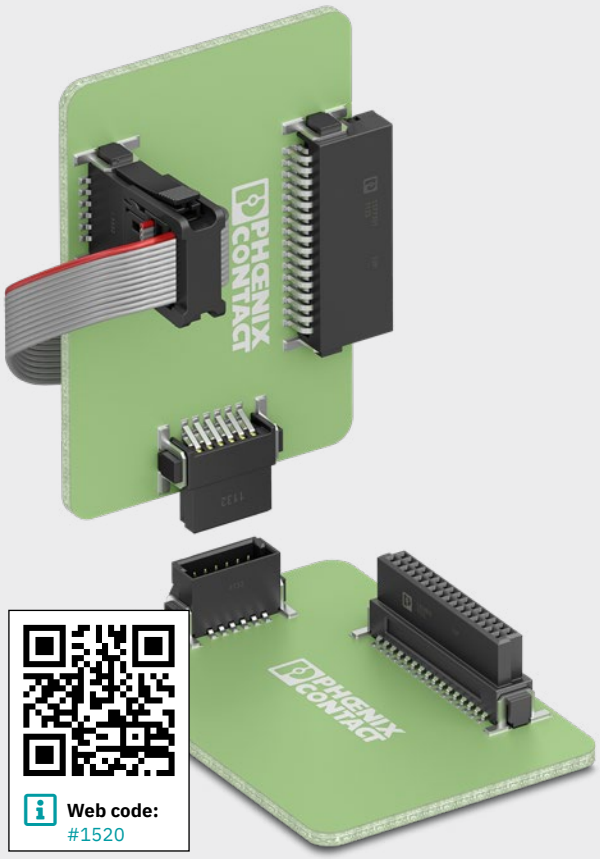
- Mezzanine high-speed board-to-board connections
- 0.635 mm pitch
- High contact density from 20- to 80-pos.
- Stack heights from 6 to 16.6 mm
- Data transmission up to 40 Gbps
- Floating tolerances: ±0.7 mm (x, y direction)

› More information starting on page 18

FP 0,8 (un)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 21 mm
- Data transmission up to 52 Gbps
- Optional shielding for excellent EMC properties

› More information starting on page 26



Web code: #1520

Unshielded FR 1,27

- Flexible board-to-board and wire-to-board connections
- 1.27 mm pitch
- High contact density from 6- to 100-pos.
- Stack heights from 8 to 20 mm
- Data transmission up to 28 Gbps

› More information starting on page 40

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FP 0,8 series	26
FR 1,27 series	40
Reliable PCB connections	52
Groundbreaking data connectors	54
Design-in support	56
Excellent services	58

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.com/webcode/#1234

Applications

Reliable connection for flexible designs

The FINEPITCH series is a secure solution for PCB connections in industrial applications such as sensors, measuring devices, EV chargers, automation systems, and industrial robots. The connectors with a high tolerance compensation are suitable for automated assembly. They ensure a stable connection even in demanding environments such as railway applications.

Web code: #2492



Drive control



5G routers

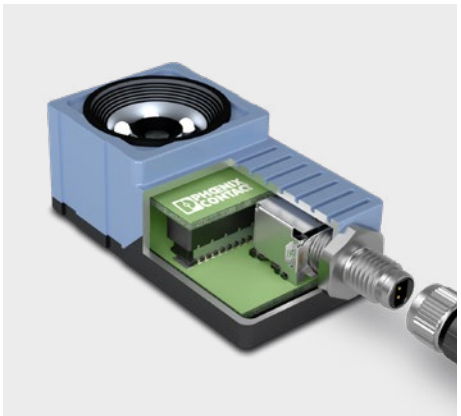
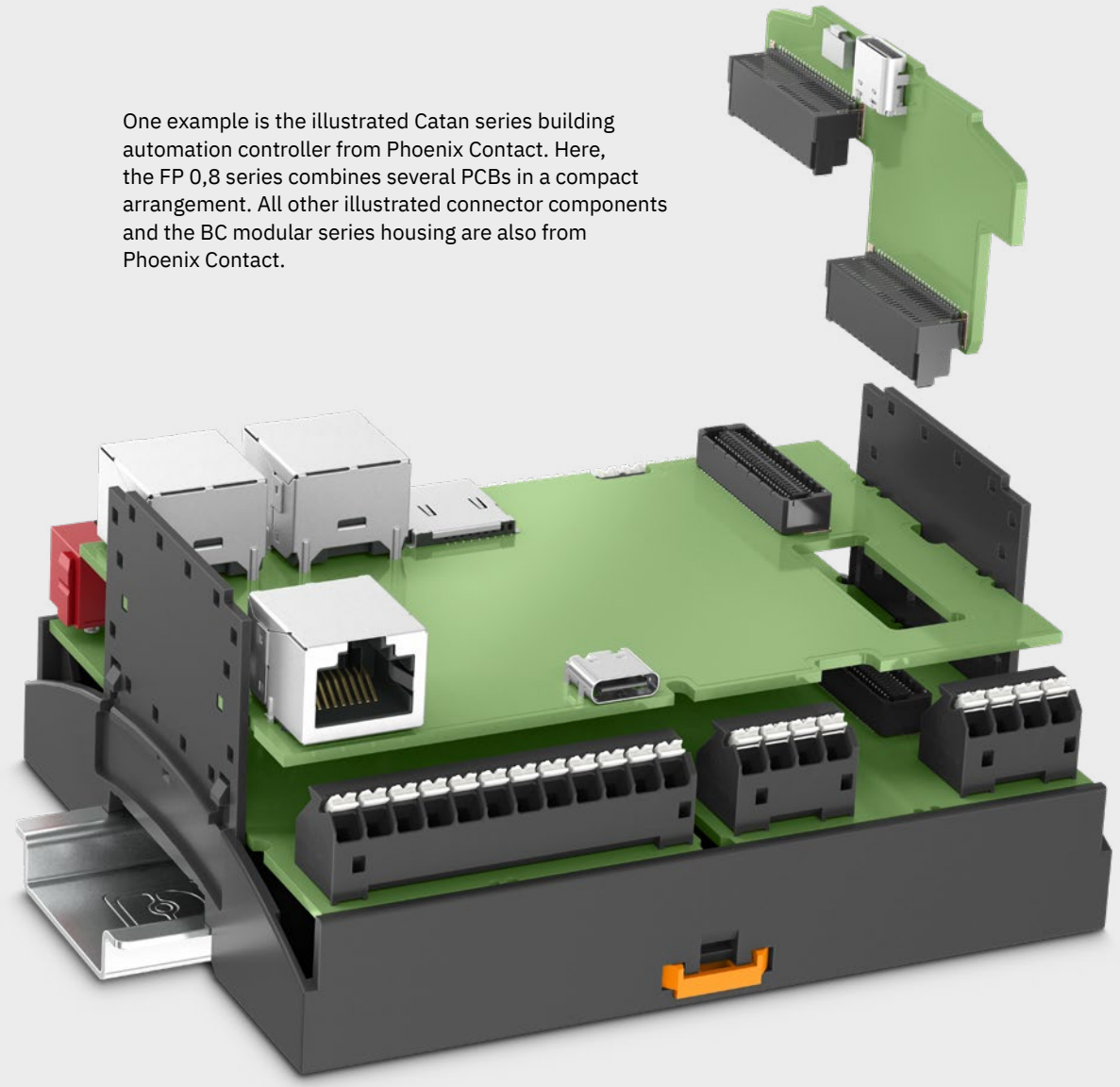


Image processing

One example is the illustrated Catan series building automation controller from Phoenix Contact. Here, the FP 0,8 series combines several PCBs in a compact arrangement. All other illustrated connector components and the BC modular series housing are also from Phoenix Contact.





Building control



Power supply



Charging Infrastructure

PICMG® ModBlox7™ ecosystem

Standardization of modular industrial PCs

The open standard of the PICMG® is based on a modular and flexible IPC system with defined mechanical and electrical connections between the individual units. Additional expensive components such as backplanes and shelf controllers are not required for this unique design.



The new, modular box PC standard: ModBlox7

Full service from Phoenix Contact

To discover our selection of connectors required for ModBlox7™, visit our website. Various standard printed circuit board connectors are also available there, which can be placed on the front PCB as I/O connectors: The complete solution from Phoenix Contact.

Web code: #3600

Connectors for ModBlox7™



Components	PSU	CPU	IOU	IOU
PSU to CPU	MC 1,5/ 6-G-3,5 P26 THRR44 Item no.: 1011107 	IMC 1,5/ 6-G-3,5 RN P20 THR Item no.: 1830605 		
PSU to CPU alternative	IFMC 1,5/6-ST-3,5 Item no.: 1844028  SPTA-THR 1,5/ 6-3,81 R44 Item no.: 1071183 	IMC 1,5/ 6-G-3,5 RN P20 THR Item no.: 1830605 		
CPU to IOU optional 2 x		FP 0,8/ 80-FH Item no.: 1104544 	FP 0,8/ 80-MH Item no.: 1104552 	
IOU to IOU optional 2 x			FP 0,8/ 80-FH Item no.: 1104544 	FP 0,8/ 80-MH Item no.: 1104552 

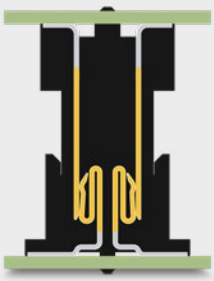
Connectors for front and rear to base PCBs: FP 0,8 series (more information starting on page 26), FR 1,27 series (more information starting on page 40), FS 0,635 series (more information starting on page 18). You will find the required IOU front PCB connectors on our website.

System overview

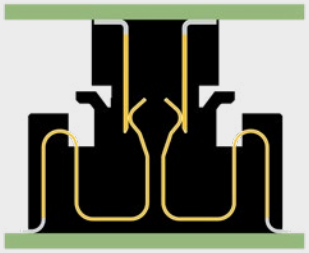
The right solution for every application

The FINEPITCH portfolio includes board-to-board connectors with various contact technologies. From cost-optimized pin headers and sockets, to commercially available PCB connectors with double contacts, to miniature PCB connectors optimized for data transmission with a slim single-break or robust ScaleX contact system, you will find the right connection for your application. With FS 0,635 Floating, there is also a female connector strip with a pitch of 0.635 mm, which features a particularly large tolerance compensation.

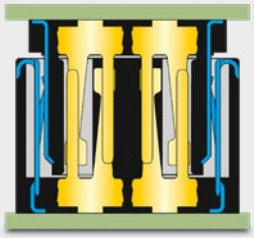
Contact technologies at a glance



FS 0,635 with slim single-beam contacts as a rigid version



FS 0,635 with single-beam contacts as a floating version



FP 0,8 with innovative ScaleX contact system

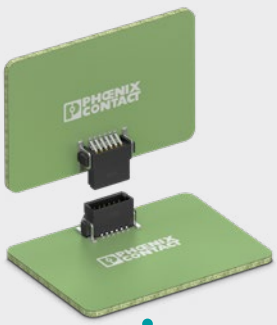


FR 1,27 with commercially available double contacts

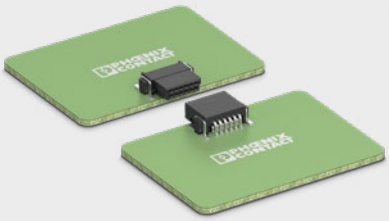
PCB arrangements at a glance



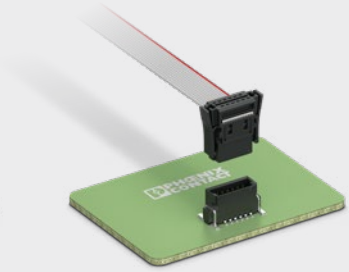
Mezzanine (sandwich arrangement)



Orthogonal (90°, mother-daughter arrangement)



Coplanar (head-to-head arrangement, extender card)



Ribbon cable connection (wire-to-board)

Overview of possible connector arrangements

				
	FS 0,635 **rigid**	**FS 0,635** **Floating**	**FP 0,8** **shielded/unshielded**	**FR 1,27**
Numbers of positions	**20, 40, 60, 80**	**20, 40, 60, 80**	**12, 20, 32, 52, 80**	**6, 10, 12, 16, 20, 26, 32, 40, 50, 68, 80, 100**
Stack height	**Mezzanine**			
6.00	6.0 mm ... 6.6 mm		6.0 mm ... 21 mm	
6.50				
7.00				
7.50				
8.00		8.0 mm ... 8.6 mm		8.0 mm ... 13.8 mm
8.50				
9.00	9.0 mm ... 9.6 mm			
9.50				
10.00	10.0 mm ... 10.6 mm			
10.50				
11.00		11.0 mm ... 11.6 mm		
11.50				
12.00	12.0 mm ... 12.6 mm	12.0 mm ... 12.6 mm		
12.50				
13.00				
13.50				
14.00				13.8 mm ... 20.0 mm (in preparation)
14.50				
15.00	15.0 mm ... 15.6 mm			
15.50				
16.00	16.0 mm ... 16.6 mm			
16.50				
17.00				
17.50				
18.00				
18.50				
19.00				
19.50				
20.00				
20.50				
21.00				
	Angled (orthogonal, coplanar)			
			Available	Available

Configurator for FR 1,27 cable assemblies

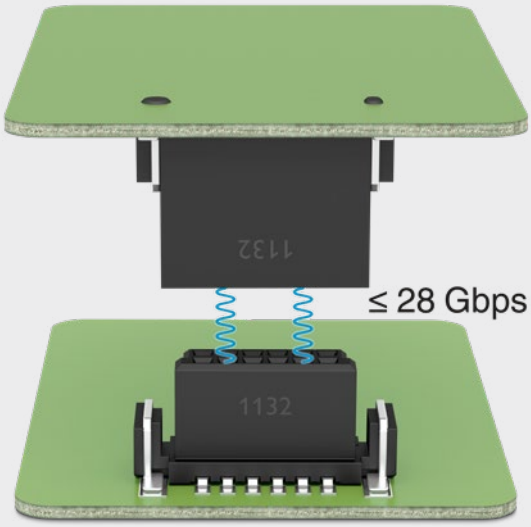
Configure and order your individual IDC female connector strip with flat-ribbon cable under item number 1498845.



Data transmission

High-speed data transmission with FINEPITCH board-to-board connectors

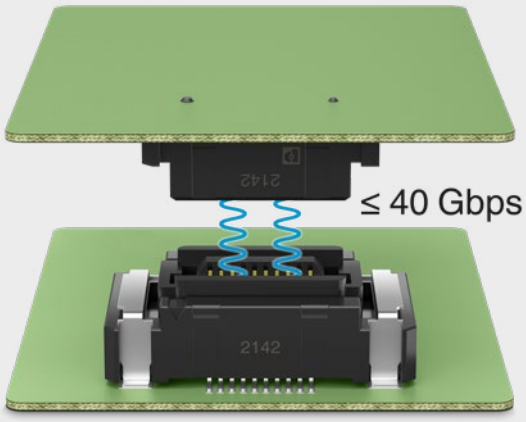
The series FR 0,8, FS 0,635, and FP 0,8 board-to-board connectors are designed for high-frequency data transmission. The three series enable the even diffusion of the electromagnetic waves, ensuring that excellent signal integrity is achieved even at high frequencies. The data transmission properties vary depending on the PCB arrangement and combination of items.



FR 1,27 series

Depending on the item combination, bandwidths up to 14 GHz and data rates up to 28 Gbps are possible with the FR 1,27 series mezzanine and angled board-to-board connectors.

› More information starting on page 40



FS 0,635 series

Depending on the item combination, bandwidths up to 20 GHz and data rates up to 40 Gbps are possible with the rigid and floating FR 0,635 series mezzanine board-to-board connector versions.

› More information starting on page 18

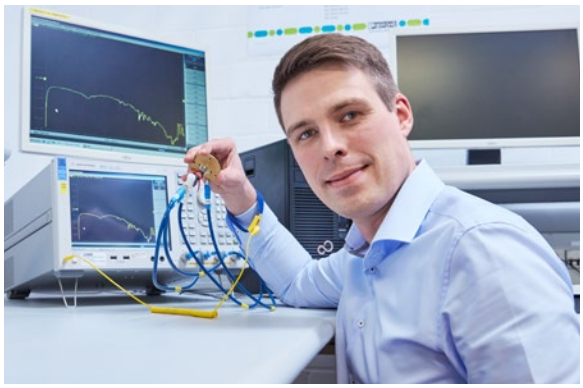
High signal integrity

Achieve high signal integrity through innovative products and comprehensive design-in support: Our engineers at Phoenix Contact work every day to optimize data connectors for Industry 4.0. We would be pleased to discuss individual applications of our FINEPITCH board-to-board connectors with customers and evaluate possible solutions.

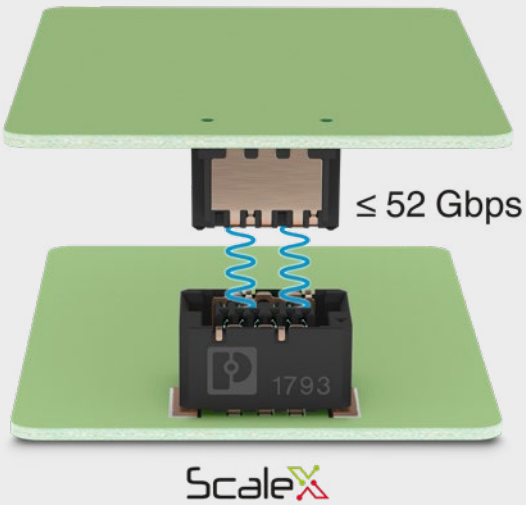
This brochure takes a closer look at selected configurations as examples. For an individual consideration of data transmission in the respective application, S-parameters for your own simulation are also provided on request.



Simulation of data transmission properties with cutting-edge software tools



Measurement of data transmission properties in our accredited laboratories



FP 0,8 series

Depending on the item combination, bandwidths up to 26 GHz and data rates up to 52 Gbps are possible with the FP 0,8 series mezzanine and angled board-to-board connectors.

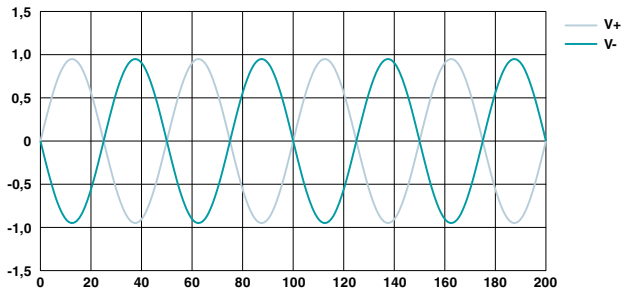
› More information starting on page 26

Basics of data transmission

Types of data transmission

The most common method of data transmission is to use differential pairs. Here, two adjacent contacts are used in which two separate pulses switch the signal at the same time.

Single-ended signals are just as common as differential data transmission. A single contact transmits the signal in the process.



High-speed data transmission

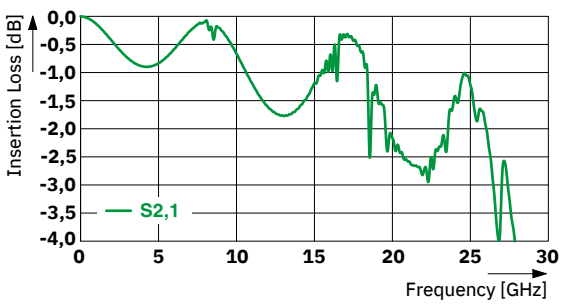
The FINEPITCH board-to-board connectors are designed for high-frequency data transmission. Common parameters are considered for the individual evaluation of the data transmission quality. The adjacent diagram illustrates the standard insertion loss, near-end crosstalk (NEXT), far-end crosstalk (FEXT), and return loss evaluation parameters for data transmission.



Insertion loss

Insertion loss indicates the loss of the signal level during data transmission from the transmitter to the receiver.

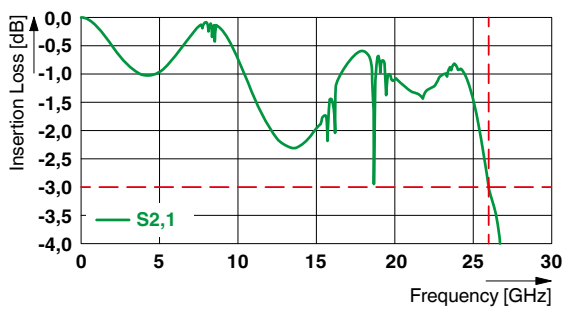
The objective is to minimize insertion loss to the extent possible. The potential bandwidth of a board-to-board connection results from the frequency at which the insertion loss reaches the value of -3 dB for the first time. An attenuation of -3 dB corresponds to a 70% reduction of the signal strength.



Example: FP 0,8/...-FV-SH 7,85 with FP 0,8/...-MV-SH 2,65, differential pair, 12 mm stack height, 100 Ω impedance environment

Data rate

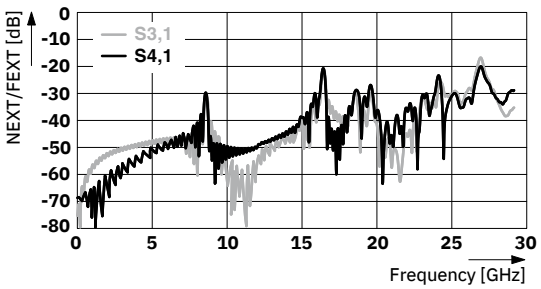
The maximum data rate can be derived from the maximum bandwidth. As such, assuming binary signal transmission, the maximum data rate in bps is twice the value of the bandwidth (e.g., bandwidth = 26 GHz → maximum data rate = 52 Gbps). The loss behavior and, consequently, also the maximum data rate vary depending on the combination of items used. So, in addition to the nominal data rate per series (e.g., 16 Gbps with FP 0,8), there is a maximum possible data rate with the appropriate combination (e.g., 52 Gbps with FP 0,8).



Reading the bandwidth at the first intersection of the loss curve with the -3 dB axis

Crosstalk

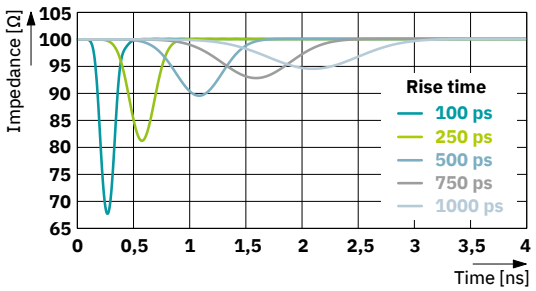
Crosstalk (X-talk) refers to the interference caused by the data transmission of or on adjacent contacts. A distinction is made between near-end crosstalk (NEXT) on the transmitter side and far-end crosstalk (FEXT) on the receiver side. Crosstalk is minimized by increasing the contact spacing and by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



Example: FP 0,8/...-FV-SH 7,85 with FP 0,8/...-MV-SH 2,65, differential pair, 12 mm stack height, 100 Ω impedance environment

Impedance

Impedance is a frequency-dependent resistance during data transmission. To avoid reflections, the impedances of the PCBs and the components installed on them must be coordinated. The FINEPITCH board-to-board connectors are optimized for impedance environments of 100 Ω with differential pairs or 50 Ω with single-ended assignments. The diagram on the right shows an example of the impedance curve for various pulse rise times.

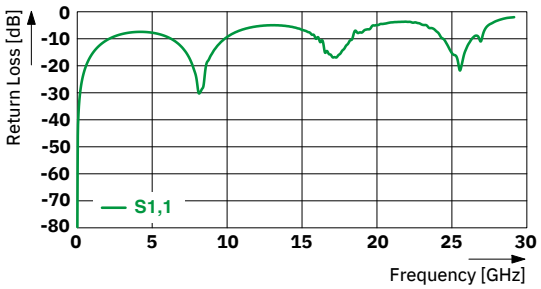


Example: FP 0,8/...-FV-SH 7,85 with FP 0,8/...-MV-SH 2,65, differential pair, 12 mm stack height, 100 Ω impedance environment

Return loss

Return loss refers to the extent to which back reflections to the signal source are attenuated in the transmission path. The goal is to keep the strength of the back-reflected signals low – as such, a strong return loss is desirable.

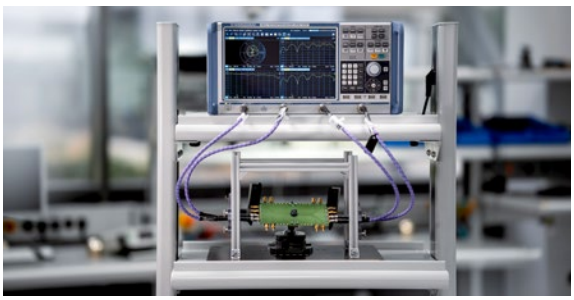
The return loss behavior is shown here as an example. Diagrams for other combinations of items are available on request.



Example: FP 0,8/...-FV-SH 7,85 with FP 0,8/...-MV-SH 2,65, differential pair, 12 mm stack height, 100 Ω impedance environment

Simulation and measurement

The data transmission and signal integrity diagrams shown in this brochure are based on simulations. These simulations were validated by reference simulations from an external partner with a different approach and by laboratory measurements. We would be happy to provide the results of the validation measurements upon request.

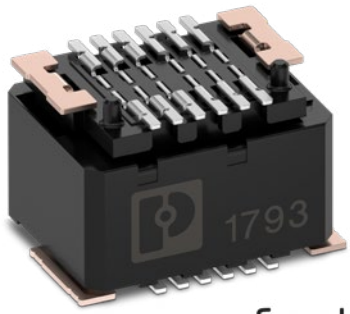


Test setup in the laboratory with FP 0,8 in a coplanar arrangement for measuring the data transmission properties

Factors influencing data transmission

Influencing factors

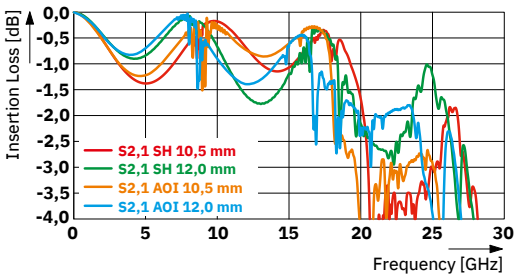
A high-speed board-to-board connection is subject to numerous influences. The transmission of high-frequency data signals between the PCBs within a device places particular requirements on the board-to-board connectors to be used. In addition to the selection and arrangement of the connectors, the PCB layout and routing and the pin assignment also play a decisive role. For reasons of comparability, only the pure connection is considered in many cases.



FP 0,8 BtB connection without PCB influence

Connector selection and use

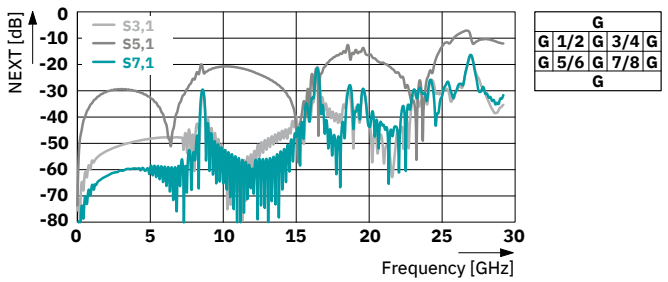
In addition to data transmission, other requirements must be taken into account when making a specific selection. Each connector system has specific properties that affect data transmission. There are also differences within a connector system, which are shown in this brochure with the largest and smallest stack height as examples. The use of the wipe tolerance also influences data transmission behavior.



FP 0,8/...-FV (-SH) 7,85 with FP 0,8/...-MV (-SH) 2,65, differential pair, 10.5 and 12 mm stack height

Pin assignment

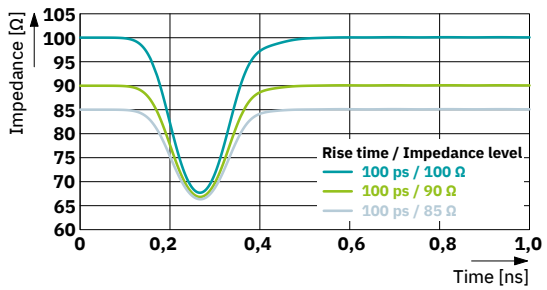
The arrangement of the data contacts has a decisive influence on the data transmission behavior. The diagrams shown here represent a G-S-S-G-S-S-G-... arrangement. A mixed-row arrangement of the differential pair results in a different behavior. The adjacent diagram shows an example of the crosstalk influence depending on the position of the next data contacts.



Example: FP 0,8/...FV(-SH) 7,85 with FP 0,8/...MV(-SH) 2,65, differential pair, 12 mm stack height, 100 Ω impedance environment

Standards and protocols

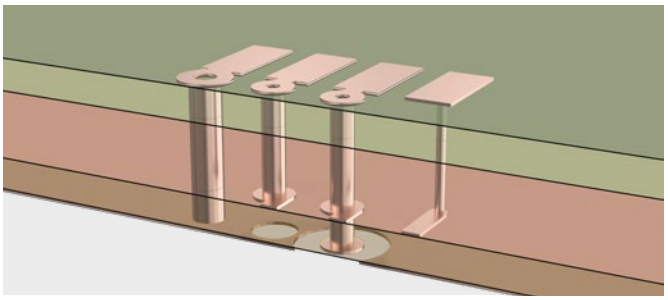
The FINEPITCH board-to-board connectors can be used for a wide range of different data transmission protocols and standards. The diagrams shown in this brochure each refer to an impedance environment of 100 Ω, as used in many applications. Depending on the data transfer protocol used, other impedance environments are required, e.g., 90 Ω for USB 2.0 or 85 Ω for USB 3.0. Corresponding illustrations are available on request.



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

PCB structure – vias

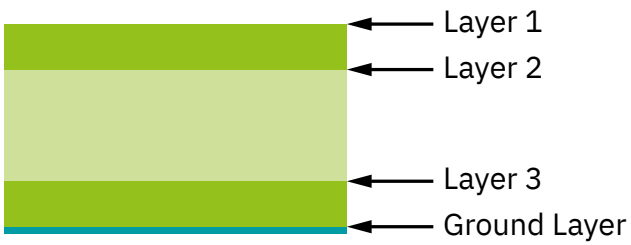
The connection between the solder pad and the conductor path can be made in various ways. Whereas with a single-layer printed circuit board, the conductor path leads directly from the solder pad, with multi-layer printed circuit boards this connection must be made using vias. A distinction is made between micro vias directly in the solder pad and vias with a separate connection. A distinction is also made between through-hole vias, blind vias, and buried vias for the connection between two layers within the PCB.



Via shapes for connecting the connector contacts: ground via, blind via, through-hole via, micro via

PCB structure – layer

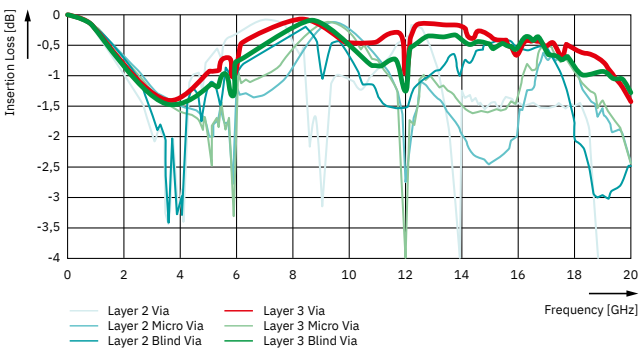
In addition to the shape and design of the vias, the PCB structure itself is of great importance. As an example, a PCB with four layers is considered below, whereby the fourth layer is a ground layer. Layers 2 and 3 are embedded in FR4 material.



Example PCB structure with four layers

PCB structure – routing

The adjacent diagram shows the insertion loss behavior for various PCB connections in layer 2 and layer 3. Depending on the form of via and the connected layer, a different curve is shown. Good loss results can be seen with both the connection with a through-hole via and a blind via on layer 3.



S-parameters and simulation service

So that the conditions of the application can be taken into account, Phoenix Contact can provide the S-parameters for the respective connector combination on request. This allows the individual application to be simulated. Our engineers will also be happy to provide individual advice.



Online advice on the signal integrity of FINEPITCH board-to-board connectors

Processing of FINEPITCH board-to-board connectors

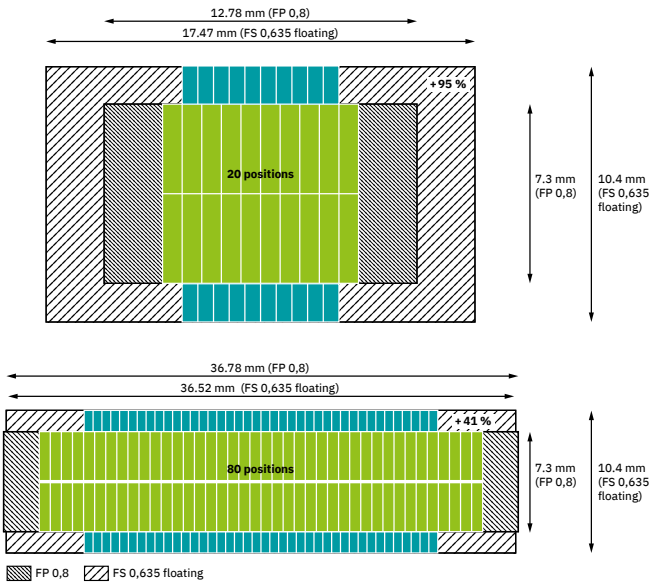
Space on the PCB – balance between miniaturization and tolerance compensation

The efficient use of the available space on a PCB is one of the biggest challenges in modern electronics design. Two central goals are often in conflict: miniaturization and tolerance compensation.

Miniaturization means fitting more and more functions into a compact space. Tolerance compensation, on the other hand, ensures that mechanical offsets are reliably compensated, which is necessary for the robotic assembly of PCBs, for example.

The illustration shows a comparison of the two product families FP 0,8 and FS 0,635 Floating. It becomes clear that a floating design with the two-part housing and spring-loaded contact offers extremely high tolerance compensation, but also requires a lot of space. In comparison, the FP 0,8 is smaller. Compared to other rigid connections, the FP 0,8 offers very high tolerance compensation and robustness.

You can easily find just the right product for any application in our board-to-board portfolio.



Comparison of the space required on the PCB by FS 0,635 Floating and FP 0,8

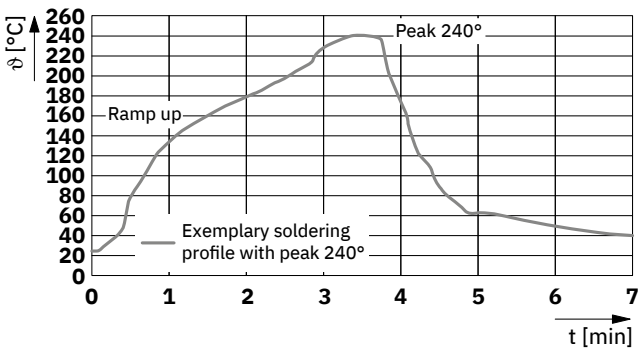
Suitable for standard soldering processes for rigid and flexible PCBs (PCB and FPC)

FINEPITCH board-to-board connectors are specially developed for the reflow soldering process. The illustration shows a typical soldering profile for FINEPITCH products. Deviating temperature and time curves are possible. The classification temperature (T_c) in accordance with JEDEC J-STD-020 is 260°C with three reflow cycles.

The coplanarity of the contacts and SMD anchor metals is checked during the production process. In this way, we ensure that you can rely on particularly high quality and reliability. The antistatic tape-on-reel packaging is ESD-capable and the MSL 1 (Moisture Sensitivity Level) means that the products can be processed directly without predrying.

The SMD solder joints are designed as gullwing contacts and meet the requirements of JEDEC J-STD Class 3, which facilitates the processing of shielded FP 0,8 products in which the contacts are located under the component. AOI or X-ray inspections confirm that the components have been processed reliably.

Certain suction surfaces are designated for easy integration into the pick-and-place assembly process. Suction pads are attached to the vertical items, and have to be removed after the reflow process.



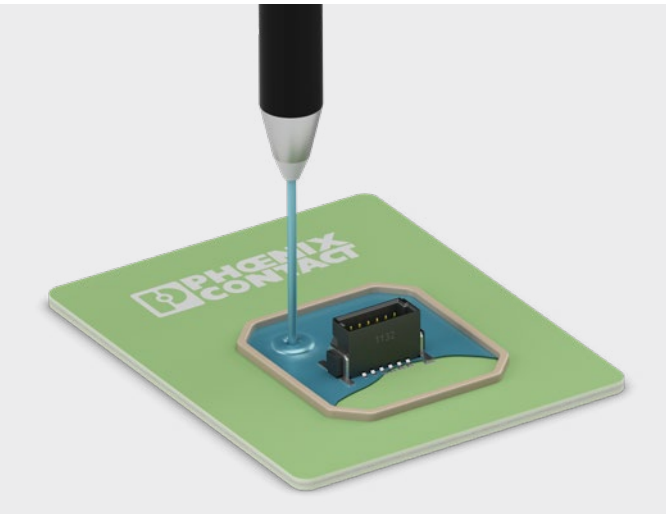
Example soldering-process temperature curve in SMD production. Connectors are tested in accordance with JEDEC J-STD-020

Potting and coating

Potting and coating are proven methods for reliably protecting electronic components against moisture, dust, and mechanical stress. They also improve the thermal properties and can prevent sensitive components from being tampered with. However, this processing concept also brings challenges: the weight and volume of the module increase. It also makes subsequent recycling more difficult.

Important for board-to-board connectors:

- The potting compound must never come into he contact area of the plug connection, as this will impair its functionality. Particular attention must be paid to the capillary effect: liquid potting compound can rise through narrow gaps into the contact area
- As every process is individual, we recommend that you check the board-to-board connection in your specific application. Use micrographs to ensure that the contact area is free of potting compound
- Check the contact resistance and current carrying capacity after thermal shock and several thermal cycles. These tests under load are necessary for detecting potential contact failures at an early stage



Digital integration into your processing concept

On the item detail page of all Phoenix Contact products you will find comprehensive information such as technical and commercial data, ECLASS and ETIM classifications, approvals, and environmental conformity. A 3D view as well as symbols and footprints in various file formats facilitate integration into your systems.

The following technical drawings are also available for download:

- Product family TecDoc: Product dimensions, recommended PCB layout, and much more
- Packaging TecDoc: Tape-on-reel packaging, alignment in the reel, and much more
- Application 2D TecDoc: Dimensions of both mating partners, PCB distances, and much more

We will be happy to support you in the design-in process, e.g., with calculations of air/creepage distances for partially assembled items, simulations and S-parameters for high-speed applications.



Further information

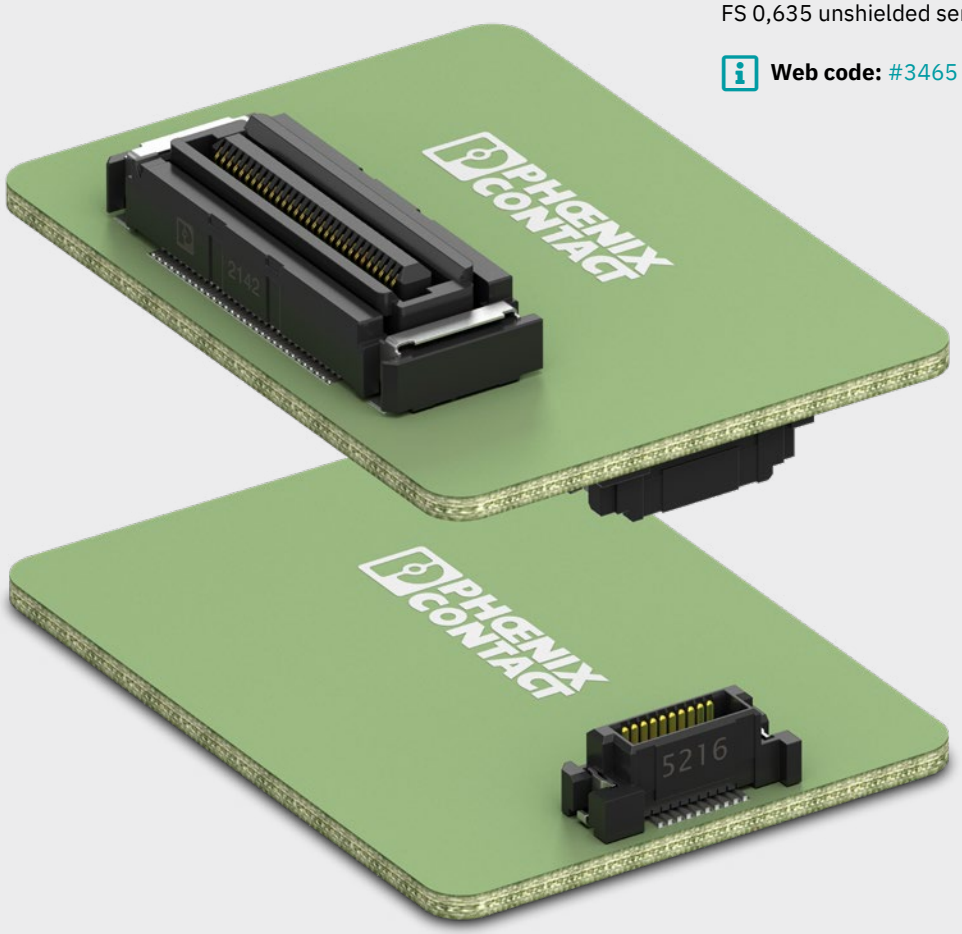
Further information on PCB assembly of connectors: **Web code:** #0921

Compact FS 0,635 series board-to-board connectors

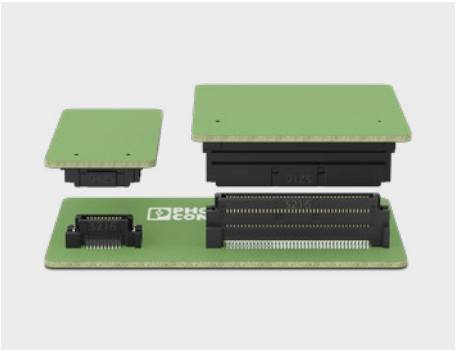
The space-saving FS 0,635 series board-to-board connectors enable mezzanine PCB arrangements with high-speed data transmission rates up to 40 Gbps. Various numbers of positions and stack heights as well as rigid and floating versions enable a high degree of freedom when it comes to the device design.

Further information on the FS 0,635 unshielded series:

Web code: #3465

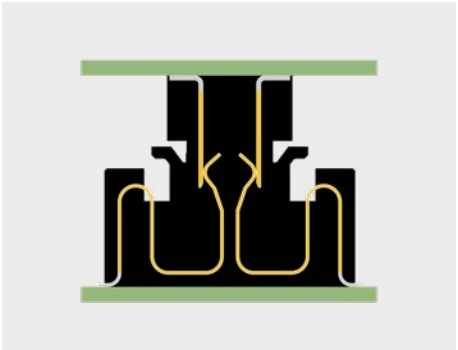


FS 0,635 series – advantages at a glance



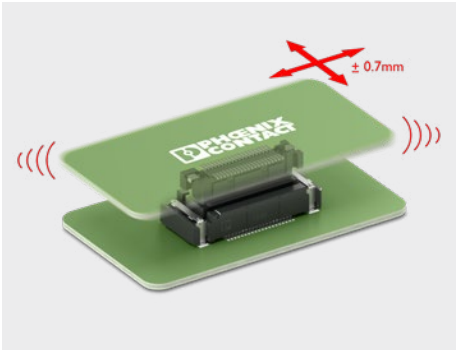
Comprehensive portfolio in all stack heights

Four different numbers of positions per stack height.



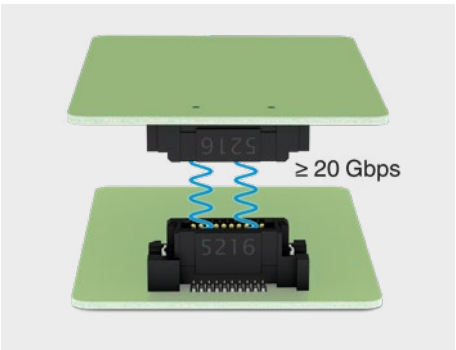
FS 0,635 Floating

Female connector strips with floating functionality ensure a tolerance compensation of ±0.7 mm in the x and y directions and 0.6 mm in the z direction.



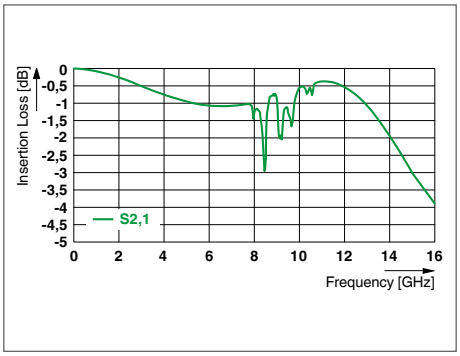
Robustness

Female connector strips with floating functionality increase the robustness of the connection against shock and vibration.



Data rates ≥20 Gbps

With exceptional signal integrity, the FS 0,635 series offer high-speed data transmission up to 40 Gbps for a wide range of applications.



Our service: customer-specific simulations

Customer-specific simulations for data integrity ensure time savings during the development process.



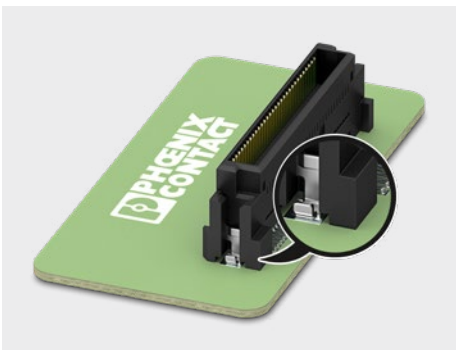
Design-in support during device development

Integration of M-CAD/E-CAD data and free sample service.



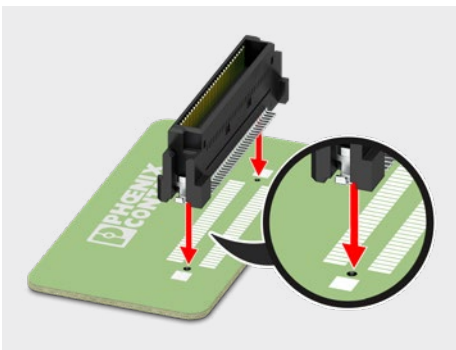
Easy mating

Integrated keyways and tolerance compensation ensure error-free production.



Stable soldering

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



Securely positioned

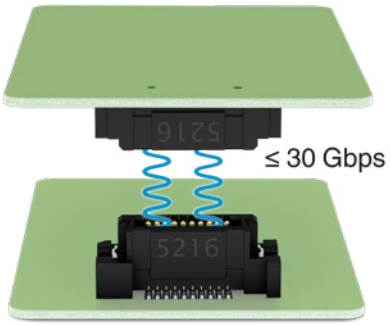
Positioning pins on the bottom ensure secure positioning on the PCB.

FS 0,635 Rigid series – data transmission properties

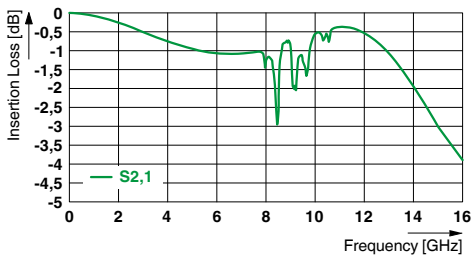
High-speed data transmission

The FS 0,635 series is suitable for data transmission up to 30 Gbps (rigid) or 40 Gbps (floating). The diagrams on the following double page show the data transmission properties with the smallest and largest possible stack height. They are based on a pin assignment with differential pairs and ground pins in the following order per contact row: G, S, S, G, S, S, G.

Additional diagrams as well as S-parameters for your own simulations are available on request.



Insertion loss

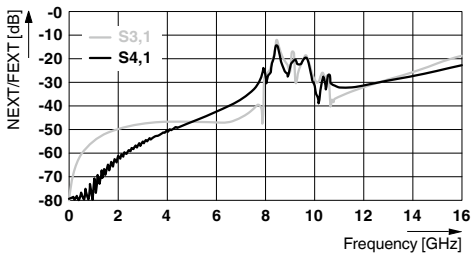


FS 0,635/...-FV-R- 4,0 with FS 0,635/...-MV-R- 5,0, differential pair, 6.0 mm stack height

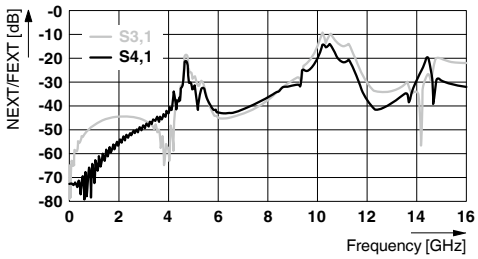


FS 0,635/...-FV-R-10,0 with FS 0,635/...-MV-R- 9,0, differential pair, 16.6 mm stack height

Crosstalk

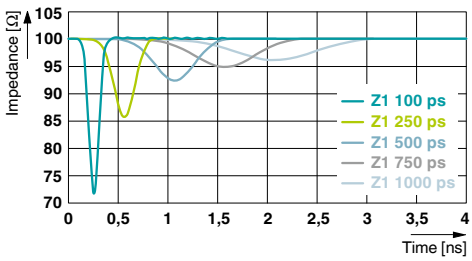


FS 0,635/...-FV-R- 4,0 with FS 0,635/...-MV-R- 5,0, differential pair, 6.0 mm stack height

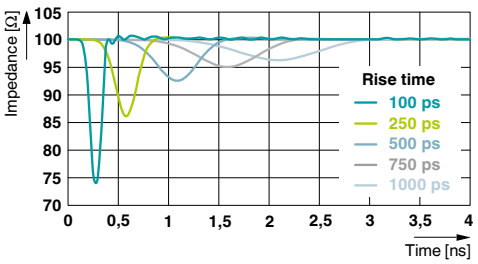


FS 0,635/...-FV-R-10,0 with FS 0,635/...-MV-R- 9,0, differential pair, 16.6 mm stack height

Impedance



FS 0,635/...-FV-R- 4,0 with FS 0,635/...-MV-R- 5,0, differential pair, 6.0 mm stack height

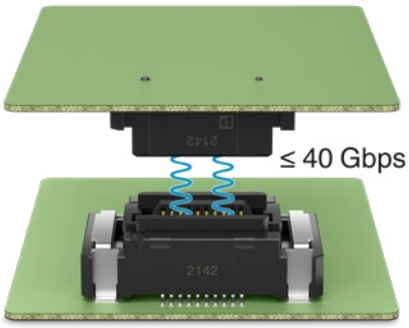


FS 0,635/...-FV-R-10,0 with FS 0,635/...-MV-R- 9,0, differential pair, 16.6 mm stack height

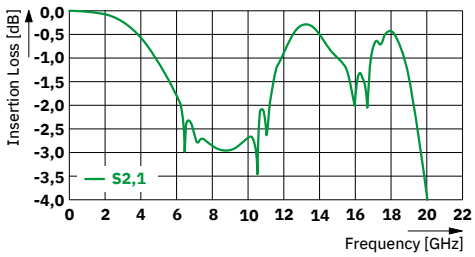
FS 0,635 Floating series – data transmission properties

Data transmission with floating connectors

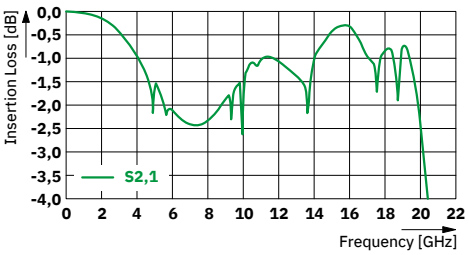
Can high-speed data transmission work with floating board-to-board connectors? The diagrams below show the data transmission properties of a regular FS 0,635 male connector strip in combination with an FS 0,635 Floating female connector strip. The configurations considered with the smallest and largest possible stack height are shown analogous to the combination with two rigid connectors on the previous page.



Insertion loss

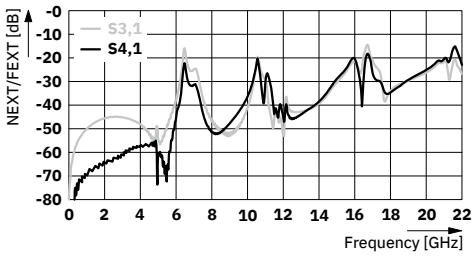


FS 0,635/...-FV-F 6,0 with FS 0,635/... MV-R 5,0, differential pair, 8.0 mm stack height

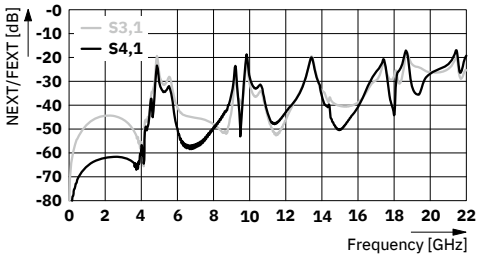


FS 0,635/...-FV-F 6,0 with FS 0,635/... MV-R 9,0, differential pair, 12.6 mm stack height

Crosstalk

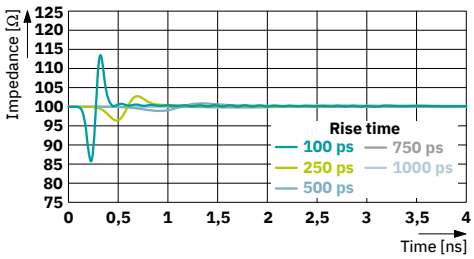


FS 0,635/...-FV-F 6,0 with FS 0,635/... MV-R 5,0, differential pair, 8.0 mm stack height

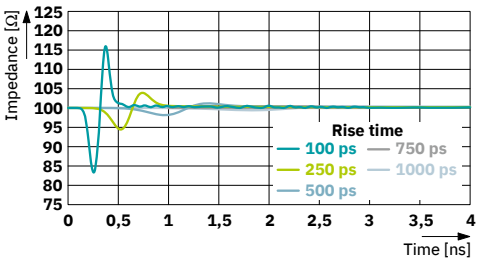


FS 0,635/...-FV-F 6,0 with FS 0,635/... MV-R 9,0, differential pair, 12.6 mm stack height

Impedance



FS 0,635/...-FV-F 6,0 with FS 0,635/... MV-R 5,0, differential pair, 8.0 mm stack height



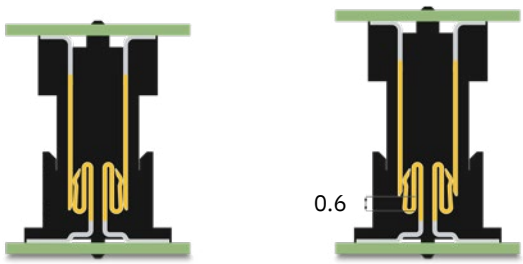
FS 0,635/...-FV-F 6,0 with FS 0,635/... MV-R 9,0, differential pair, 12.6 mm stack height

FS 0,635 series – installation instructions

Stack heights

The FS 0,635 series male and female connector strips enable various stack heights in the range from 6.0 mm to 16.6 mm. The stack height describes the distance between two PCBs overlapping in parallel. The stack heights have a permissible height tolerance of 0.6 mm. The adjacent table lists the possible PCB clearances. Further stack heights are planned for the coming years.

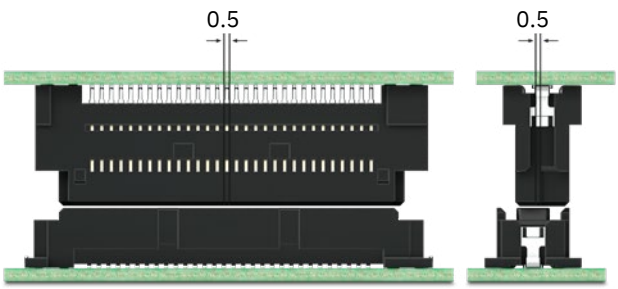
Stack height	Male connector strip	Female connector strip, rigid	Female connector strip, floating
6.0 mm … 6.6 mm	FS 0,635/…-MV-R-5,0	FS 0,635/…-FV-R-4,0	
8.0 mm … 8.6 mm	FS 0,635/…-MV-R-5,0		FS 0,635/…-FV-F-6,0
9.0 mm … 9.6 mm	FS 0,635/…-MV-R-8,0	FS 0,635/…-FV-R-4,0	
10.0 mm … 10.6 mm	FS 0,635/…-MV-R-9,0	FS 0,635/…-FV-R-4,0	
11.0 mm … 11.6 mm	FS 0,635/…-MV-R-8,0		FS 0,635/…-FV-F-6,0
12.0 mm … 12.6 mm	FS 0,635/…-MV-R-5,0	FS 0,635/…-FV-R-10,0	
	FS 0,635/…-MV-R-9,0		FS 0,635/…-FV-F-6,0
15.0 mm … 15.6 mm	FS 0,635/…-MV-R-8,0	FS 0,635/…-FV-R-10,0	
16.0 mm … 16.6 mm	FS 0,635/…-MV-R-9,0	FS 0,635/…-FV-R-10,0	



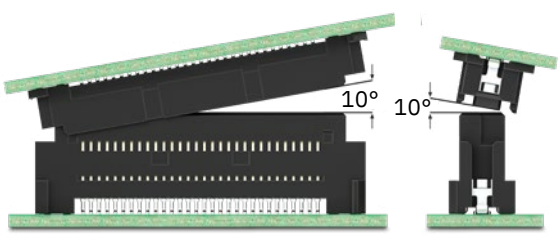
Minimum and maximum PCB clearance with wipe length

Tolerance compensation, FS 0,635 Rigid

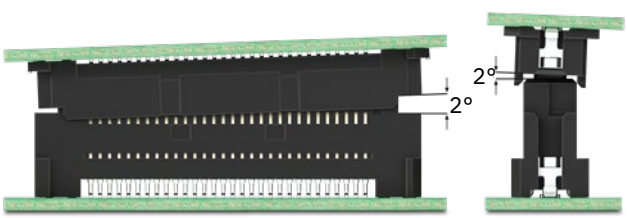
During the plugging process, the connectors have a position tolerance of ±0.5 mm in the longitudinal and transverse directions. The geometry also enables an inclination tolerance of ±10° during connection, and ±2° when connected. These flexible tolerance compensations enable a flexible design of the PCB arrangement.



Center offset when plugging in



Inclination tolerance when connecting

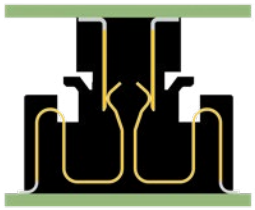


Inclination tolerance when connected

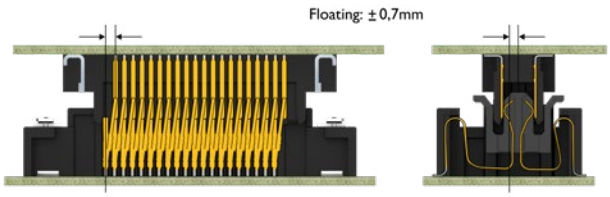
FS 0,635 series – installation instructions

Floating board-to-board connectors

Unlike a rigid board-to-board connection, a combination with FS 0,635 Floating can compensate for misalignments of ±0.7 mm in the x and y directions. This capability is realized by an appropriately designed contact and a two-part housing. The floating feature compensates for design tolerances and mechanical movement caused by vibration and thermal effects. Influences on the solder joints are minimized by the spring effect of the contacts. The tolerance compensation in the plug-in direction (wipe length) of 0.6 mm applies for FS 0,635 Floating in the same way as for the rigid versions.

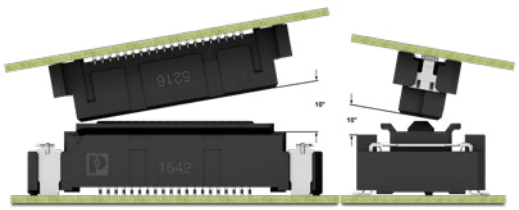


Floating contact system

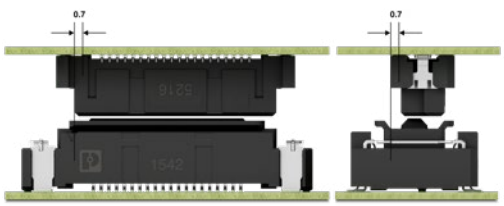


How the floating contact system works

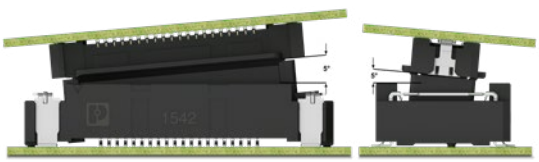
Tolerance compensation, FS 0,635 Floating



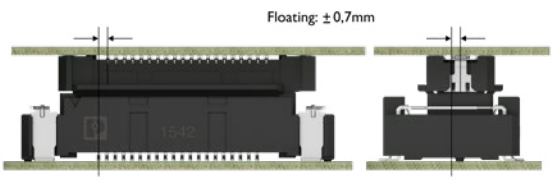
Inclination tolerance when connecting



Center offset when plugging in



Inclination tolerance when connected



Position tolerance compensation when plugged in

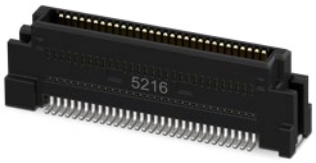
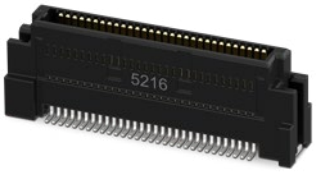
FS 0,635 series – technical data

General technical data	Rigid	Floating	Standards/note
Pitch	0.635 mm		
Numbers of positions	20, 40, 60, 80		
Data transmission speed	Up to 30 Gbps	Up to 40 Gbps	
Nominal current at full current, 60-pos. (at 20°C)	0.5 A (per contact)		IEC 60512-5-2:2002
Insulation resistance	Min. 1 GΩ		IEC 60512-3-1:2002
Contact resistance (depending on stack height)	6.0 mm ... 6.6 mm: ≤40 mΩ 9.0 mm ... 9.6 mm: ≤50 mΩ 10.0 mm ... 10.6 mm: ≤50 mΩ 12.0 mm ... 12.6 mm: ≤60 mΩ 15.0 mm ... 15.6 mm: ≤70 mΩ 16.0 mm ... 16.6 mm: ≤70 mΩ	8.0 mm ... 8.6 mm: ≤50 mΩ 11.0 mm ... 11.6 mm: ≤60 mΩ 12.0 mm ... 12.6 mm: ≤60 mΩ	IEC 60512-2-1:2002
Floating tolerance	-	±0.7 mm (x/y direction)	
Test voltage	500 V AC		IEC 60512-4-1:2003
Air clearances and creepage distances	Min. 0.19 mm		
Temperature limits during operation	-55°C ... +125°C		IEC 60664-1:2020
Rated voltage (I/1)	125 V		IEC 60664-1:2020
Rated surge voltage (I/1)	0.8 kV		
Insertion and withdrawal force per contact	≤0.7 N		
Approval	UL 1977 / CSA C22.2 No 182-3		
Environmental and durability tests			
Service life	50 insertion cycles		IEC 60512-9-1:2010
Oscillation, sinusoidal	10 Hz ... 55 Hz, 18g		IEC 60512-6-4:2002
Contact interference during oscillation, sinusoidal	<1 µs		IEC 60512-2-5:2003
Shocks, half-sinusoidal	50g, 11 ms		IEC 60512-6-3:2002
Contact interference during shocks, half-sinusoidal	<1 µs		IEC 60512-2-5:2003
Shock and vibration tests for railway applications	-	Category 1 and 2 passed	IEC 61373
Information on metal parts			
Note	WEEE/RoHS-compliant		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, IIIb		
Color	Black		
Resistance to creepage	CTI 150		DIN EN 60112 (VDE 030311)
Flammability rating in accordance with UL 94	V0		
Processing note			
Process	SMD soldering		Based on IPC/JEDEC J-STD- 020D.1:2008-03
Moisture sensitivity level	MSL 1		
Coplanarity	≤0.1 mm (20-, 40-, and 60-pos.) ≤0.12 mm (80-pos.)		
Packaging	Tape-on-reel		

FS 0,635 series – product overview

Web code: #3465

Male connector strips

	Installed height 5.0 mm / base height 2.0 mm		Installed height 8.0 mm / base height 5.0 mm		Installed height 9.0 mm / base height 6.0 mm	
						
Number of positions	**Type**	**Item no.**	**Type**	**Item no.**	**Type**	**Item no.**
20	FS 0,635/ 20-MV-R- 5,0	1332120	FS 0,635/ 20-MV-R- 8,0	1332124	FS 0,635/ 20-MV-R- 9,0	1332195
40	FS 0,635/ 40-MV-R- 5,0	1332121	FS 0,635/ 40-MV-R- 8,0	1332125	FS 0,635/ 40-MV-R- 9,0	1332196
60	FS 0,635/ 60-MV-R- 5,0	1332122	FS 0,635/ 60-MV-R- 8,0	1332126	FS 0,635/ 60-MV-R- 9,0	1332197
80	FS 0,635/ 80-MV-R- 5,0	1332123	FS 0,635/ 80-MV-R- 8,0	1332127	FS 0,635/ 80-MV-R- 9,0	1332198

Female connector strips

	Installed height 4.0 mm		Installed height 10.0 mm	
				
Number of positions	**Type**	**Item no.**	**Type**	**Item no.**
20	FS 0,635/ 20-FV-R- 4,0	1331962	FS 0,635/ 20-FV-R-10,0	1334089
40	FS 0,635/ 40-FV-R- 4,0	1333897	FS 0,635/ 40-FV-R-10,0	1334090
60	FS 0,635/ 60-FV-R- 4,0	1333898	FS 0,635/ 60-FV-R-10,0	1334091
80	FS 0,635/ 80-FV-R- 4,0	1333899	FS 0,635/ 80-FV-R-10,0	1334092

Floating female connector strips

	Installed height 6.0 mm
	

Number of positions	Type	Item no.
20	FS 0,635/ 20-FV-F- 6,0	1439169
40	FS 0,635/ 40-FV-F- 6,0	1439170
60	FS 0,635/ 60-FV-F- 6,0	1439171
80	FS 0,635/ 80-FV-F- 6,0	1439174

Many possible applications

Combine a male connector strip with a rigid female connector strip with installed heights of 4 and 10 mm or a floating female connector strip with an installed height of 6 mm. With the option of using either a rigid or a floating female connector strip, the FS 0,635 product family offers the right solution for a wide range of applications.

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. It also supports high-speed data rates up to 52 Gbps. The shielding ensures excellent electromagnetic behavior. The portfolio now includes another unshielded version without AOI capability. This uses the same PCB layout as the shielded version. This addition creates a unique, flexible portfolio with mezzanine, orthogonal, and coplanar PCB arrangements.

Further information on
the FP 0,8 shield-free series:

Web code: #3684



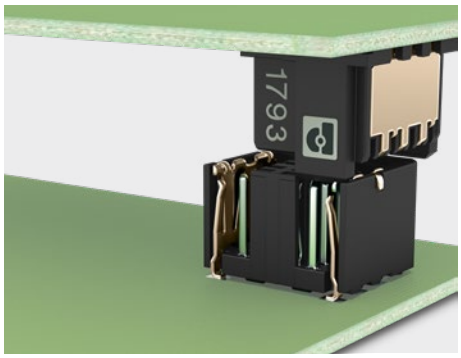
Further information on the
FP 0,8 unshielded series:

Web code: #2330

Further information on the
FP 0,8 shielded series:

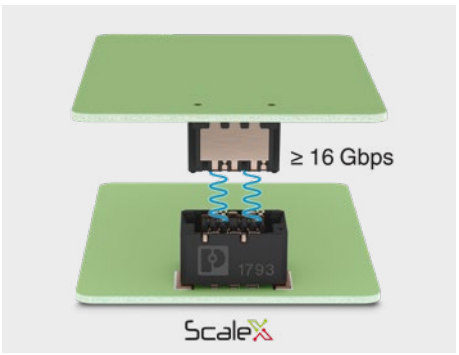
Web code: #2050

FP 0,8 series – advantages at a glance



Robust insertion with high tolerance compensation

The housing geometry and hermaphroditic double contact ensure the compensation of insertion and PCB tolerances.



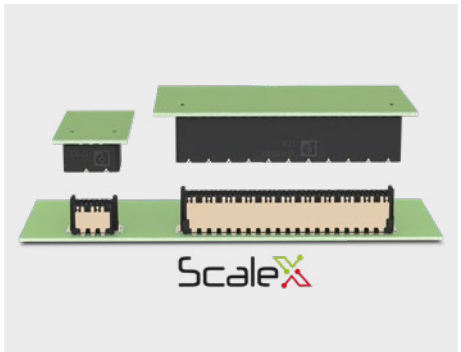
High data rate ≥16 Gbps

The FP 0,8 series offers signal integrity with data rates up to 52 Gbps.



Reliable connection

The double contact enables a variable wipe length of 1.5 mm and an additional contact overlap of 0.8 mm for safety.



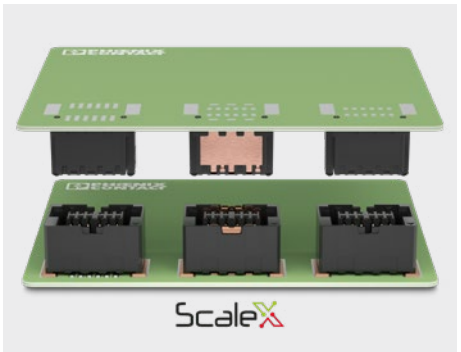
Flexible device design

Stack heights from 6 to 21 mm enable a great deal of freedom for the device design.



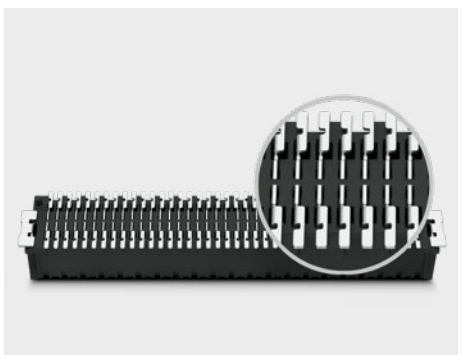
Multiple connections

The high level of flexibility and tolerance compensation enable the printed circuit boards to be connected to several connectors at the same time.



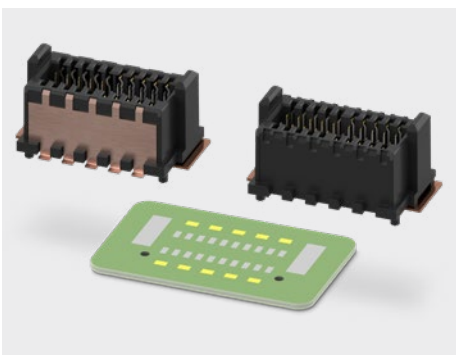
High variability in just one portfolio

Featuring the identical tolerances, stack heights, and mechanical properties, the unshielded, shield-free, and shielded versions enable a wide range of applications.



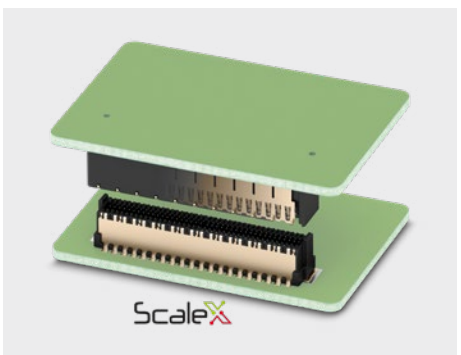
Automatic quality control

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



PCB footprints

The compatible PCB footprint enables the flexible replacement of shielded (SH) and unshielded (SL) versions.

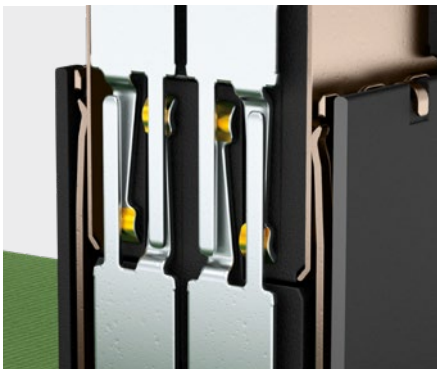


Additional protection with EMC shielding

The shielded versions have excellent protection against electromagnetic interference.

Innovative contact system

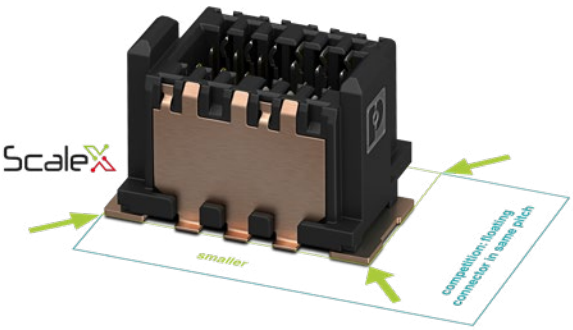
The FP 0,8 series with ScaleX technology features a unique double contact. The contacts are designed to be hermaphroditic and therefore consist of a male and a female element. This enables vibration-resistant connection in a very tight space. The contacts have gull-wing solder pins, which are ideal for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



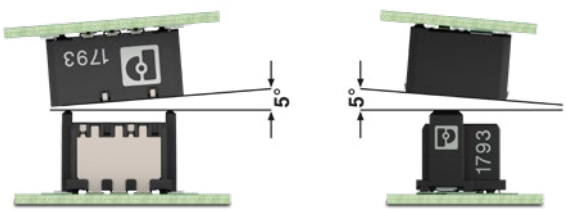
Robustness and tolerance compensation

The housings of the FP 0,8 series protect the contacts against damage in the event of mismatching. This housing geometry also enables the mating partners to position themselves together. Reliable mating is ensured, even with a center offset of ±0.7 mm and an inclination deviation of ±5°.

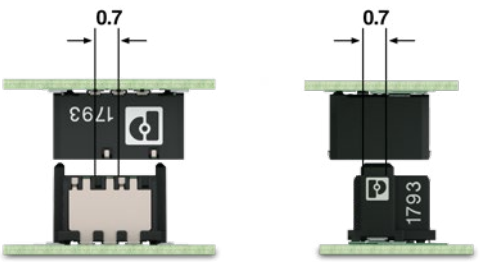
When connected, a longitudinal and transverse positional deviation of ±0.3 mm and an inclination deviation of ±5° is possible. Together with the wiping tolerance of 1.5 mm, FP 0,8 offers a high degree of flexibility in PCB design, e.g., due to the ability to establish multiple connections of two PCBs.

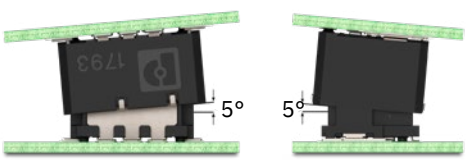


Space requirement compared with a common floating connector with the same pitch

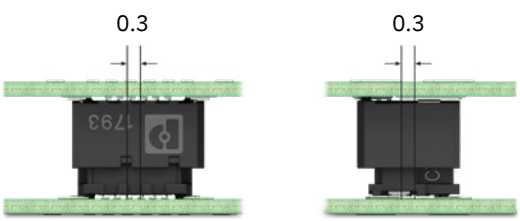


Inclination tolerance when connecting





Inclination tolerance when connected



Position tolerance compensation when plugged in

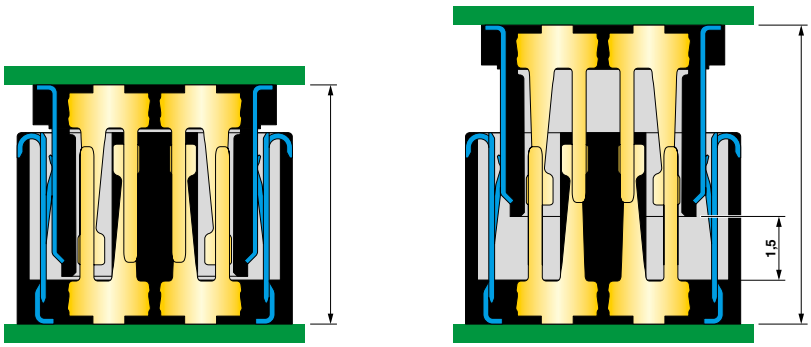
Flexible device design

Various stack heights can be realized through the arrangement of vertical male and female connector strips. The stack height describes the distance between two PCBs overlapping in parallel.

A range from 6 mm to 21 mm can be covered comprehensively with just four male and three female connector strips. Within this range, the mating partners offer a variable wipe length of 1.5 mm.

The male connector strip is fully inserted into the female connector strip with the respective minimum PCB spacing. This minimizes product variance while simultaneously providing a high degree of flexibility for device design.

Stack height	Male connector strip	Female connector strip
6 mm ... 7.5 mm	FP 0,8/...-MV(-SH/-SL) 1,15	FP 0,8/...-FV(-SH/-SL) 4,85
7.5 mm ... 9 mm	FP 0,8/...-MV(-SH/-SL) 2,65	FP 0,8/...-FV(-SH/-SL) 4,85
9 mm ... 10.5 mm	FP 0,8/...-MV(-SH/-SL) 1,15	FP 0,8/...-FV(-SH/-SL) 7,85
10.5 mm ... 12 mm	FP 0,8/...-MV(-SH/-SL) 2,65	FP 0,8/...-FV(-SH/-SL) 7,85
12 mm ... 13.5 mm	FP 0,8/...-MV(-SH/-SL) 7,15	FP 0,8/...-FV(-SH/-SL) 4,85
13.5 mm ... 15 mm	FP 0,8/...-MV(-SH/-SL) 8,65	FP 0,8/...-FV(-SH/-SL) 4,85
15 mm ... 16.5 mm	FP 0,8/...-MV(-SH/-SL) 7,15	FP 0,8/...-FV(-SH/-SL) 7,85
16.5 mm ... 18 mm	FP 0,8/...-MV(-SH/-SL) 8,65	FP 0,8/...-FV(-SH/-SL) 7,85
18 mm ... 19.5 mm	FP 0,8/...-MV(-SH/-SL) 7,15	FP 0,8/...-FV(-SH/-SL) 10,85
19.5 mm ... 21 mm	FP 0,8/...-MV(-SH/-SL) 8,65	FP 0,8/...-FV(-SH/-SL) 10,85



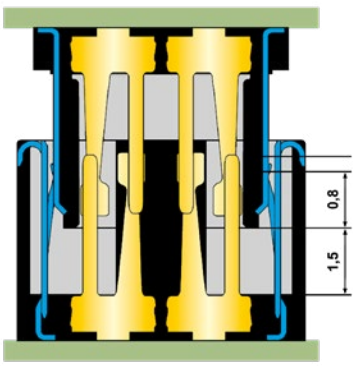
Minimum PCB spacing (left) and maximum PCB spacing (right) due to the wipe length

Secure contacting

The hermaphroditic double contacts have a safe coverage of 2.3 mm once the female and male connector strips are fully connected.

This contact overlap refers to the contacting of the resilient contact area on the planar pin section. The finding area with the contact insertion chamfers is added to the ensured 2.3 mm.

A variable wipe length of 1.5 mm applies to each connector pair in order to offer flexible stack heights between 6 and 21 mm in the portfolio of male and female connectors. This wipe length was tested and approved in the laboratory as part of the item qualification process. When this wipe range is used, a contact reliability of 0.8 mm remains. This enables tilt tolerances in the connected state, for example.



Areas of contacting the ScaleX contacts

FP 0,8 series – version overview



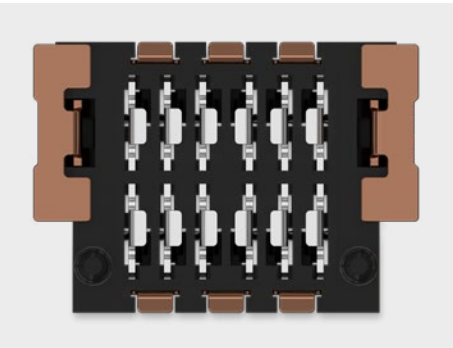
FP 0,8-SH with shielding



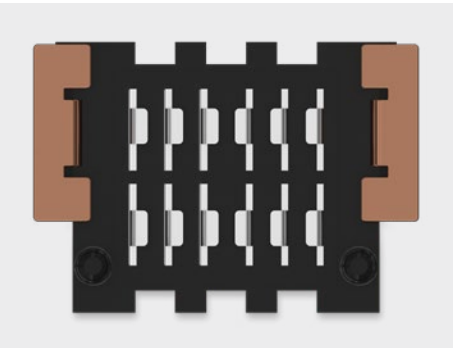
FP 0,8-SL without shielding



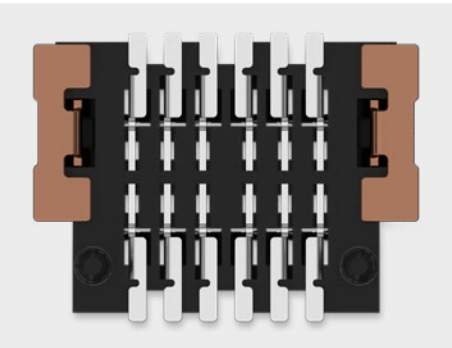
FP 0,8 without shielding



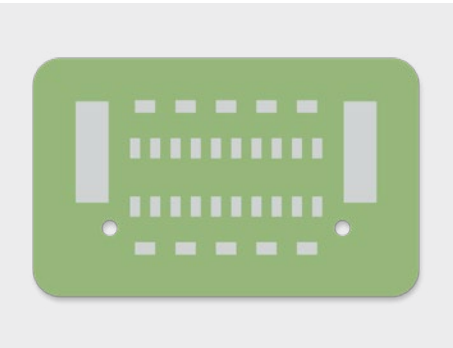
FP 0,8-SH, with shielding, signal contacts are located under the housing



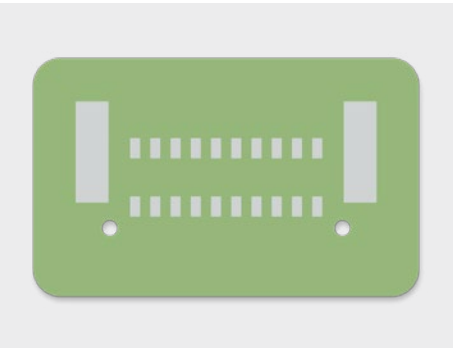
FP 0,8-SL, signal contacts are located under the housing



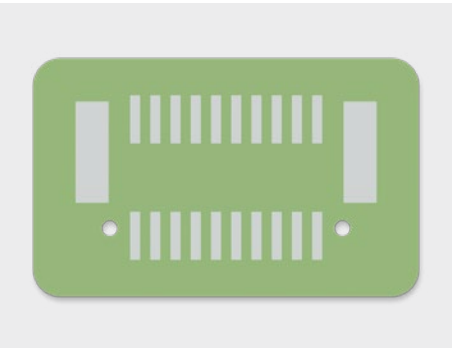
FP 0,8, with AOI-capable signal contacts



FP 0,8-SH footprint, located under the housing



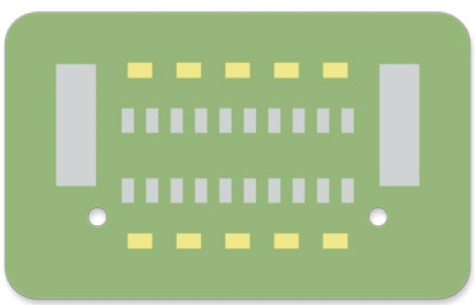
FP 0,8-SL footprint



FP 0,8-AOI footprint

FP 0,8-SH and FP 0,8-SL footprint compatibility

The FP 0,8-SL and FP 0,8-SH product versions have a special feature within the FP 0,8 portfolio. Both can be soldered on the PCB footprint of the FP 0,8-SH version. If an FP 0,8-SL is used on the footprint of an FP 0,8-SH, the solder pads of the shield connection are not used. The footprint compatibility of the two versions allows switching between shielded and unshielded FP 0,8 versions without changing the PCB layout. This ensures maximum flexibility and cost-effectiveness during device development.

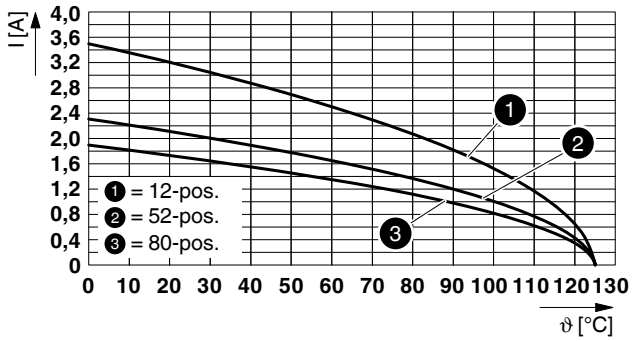


Comparison of the footprints

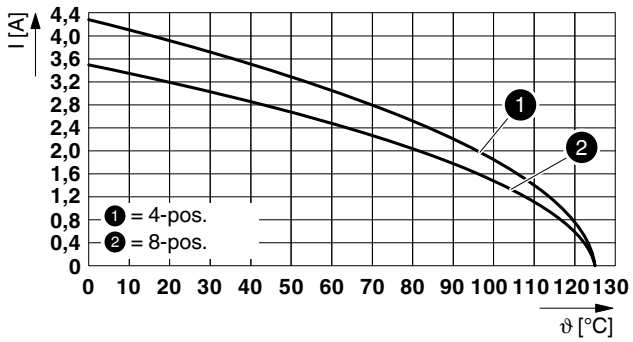
Power transmission of signal contacts

The nominal current for the FP 0,8 series board-to-board connectors is 1.7 A per contact. This nominal current results from the full current of the largest number of positions in the current carrying capacity test, taking into account the derating factor of 0.8. In the derating curves, the nominal current is usually read at +20°C for board-to-board connectors.

Due to the lower total heating, there is a significantly higher current carrying capacity per pin both for the full current supply of smaller numbers of positions and for the partial current supply of individual contacts. Thus, depending on the application, significantly higher currents than 1.7 A per contact can be transmitted.



Current transmission with different numbers of positions using the example of FP 0,8/..-MV-SH 2,65 with FP 0,8/..-FV-SH 7,85



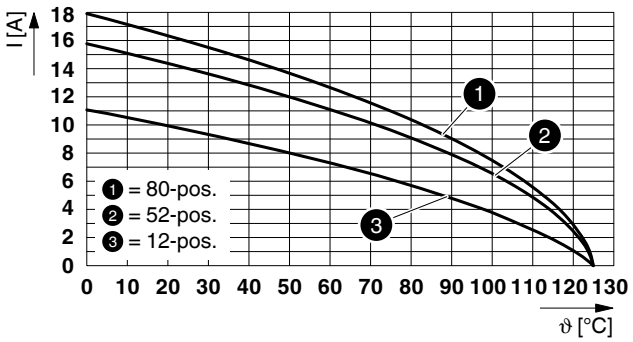
Current transmission with partial current flow using the example of FP 0,8/..-MV-SH 2,65 with FP 0,8/..-FV-SH 7,85

Shielding plate power transmission

In addition to the characteristic function of shielding, the shielding plate of the FP 0,8 board-to-board connectors can also be used for power transmission.

This characteristically results in different current transfer capacities for each number of positions. As can be seen in the adjacent derating diagram using the example of FP 0,8/..-MV-SH 2,65 with FP 0,8/..-FV-SH 7,85, the current transmission per shield metal side for a 12-pos. board-to-board connection is around 10 A. For an 80-pos. combination, around 16 A can be transmitted per shield metal side.

Theoretically, when the 80-pos. board-to-board connector FP 0,8/..-MV-SH 2,65 is fully loaded with FP 0,8/..-FV-SH 7,85, it is possible to transmit 2 x 16 A + 80 x 1.7 A = 168 A, taking into account currents of the signal contacts, which depend on the number of positions (see previous page).



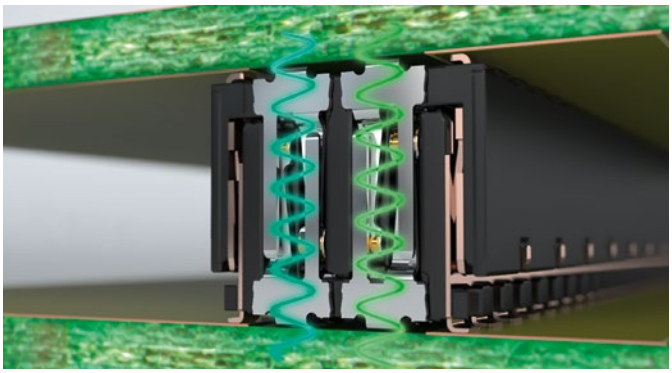
Current transmission of a shield metal based on the example of FP 0,8/..-MV-SH 2,65 with FP 0,8/..-FV-SH 7,85

High-speed data transmission

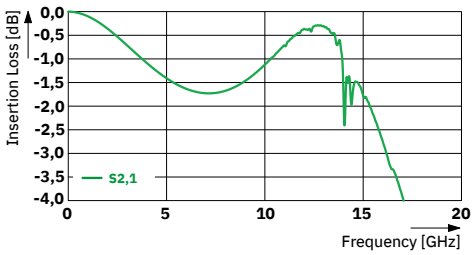
The FP 0,8 series is ideally suited for high-speed data transmissions up to 52 Gbps. Excellent signal integrity is achieved even at high frequencies up to 26 GHz.

The following diagrams illustrate the data transmission properties of the smallest and largest possible stack height in assignments with differential pairs and ground pins in the following order per contact row: G, S, S, G, S, S, G.

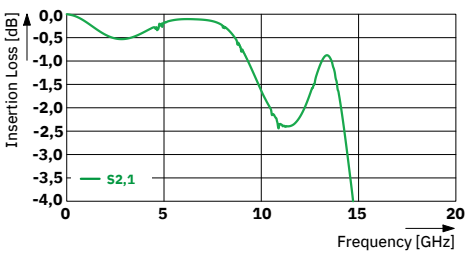
Additional diagrams as well as S-parameters for your own simulations are available on request.



Insertion loss

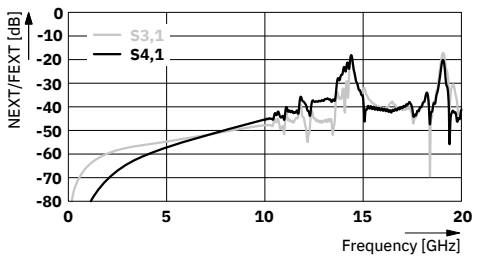


FP 0,8/...-FV-SH 4,85 with FP 0,8/...-MV-SH 1,15, differential pair, 6.0 mm stack height

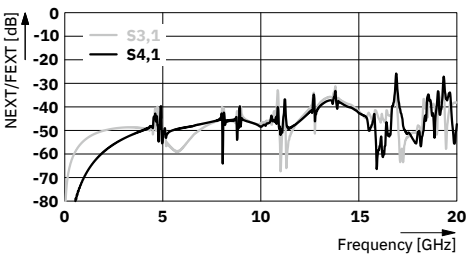


FP 0,8/...-FV-SH 10,85 with FP 0,8/...-MV-SH 8,65, differential pair, 21.0 mm stack height

Crosstalk

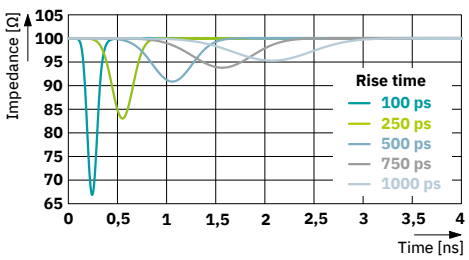


FP 0,8/...-FV-SH 4,85 with FP 0,8/...-MV-SH 1,15, differential pair, 6.0 mm stack height

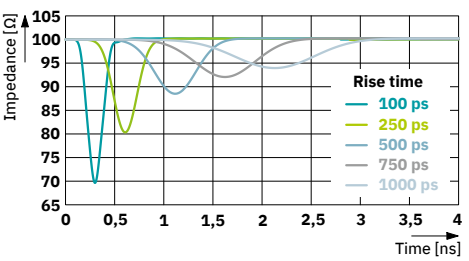


FP 0,8/...-FV-SH 10,85 with FP 0,8/...-MV-SH 8,65, differential pair, 21.0 mm stack height

Impedance



FP 0,8/...-FV-SH 4,85 with FP 0,8/...-MV-SH 1,15, differential pair, 6.0 mm stack height

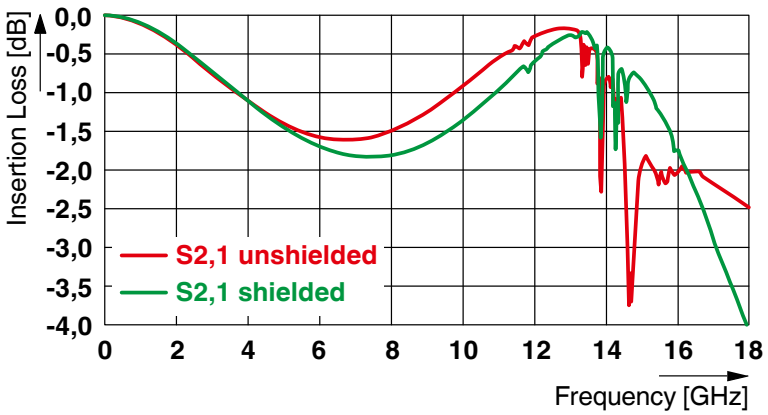


FP 0,8/...-FV-SH 10,85 with FP 0,8/...-MV-SH 8,65, differential pair, 21.0 mm stack height

Shielded vs. unshielded

Generally, the same data and signals can be transmitted through both shielded and unshielded connectors. Geometrically, the contacts in the standard versions have only a different design of the soldering surfaces. The shielded types have signal contacts with internal gull-wing soldering surfaces. They protrude from under the housing on the unshielded versions, enabling AOI control of soldering results. In contrast, the shielded types use CT or X-ray analysis, for example, to evaluate the soldering results.

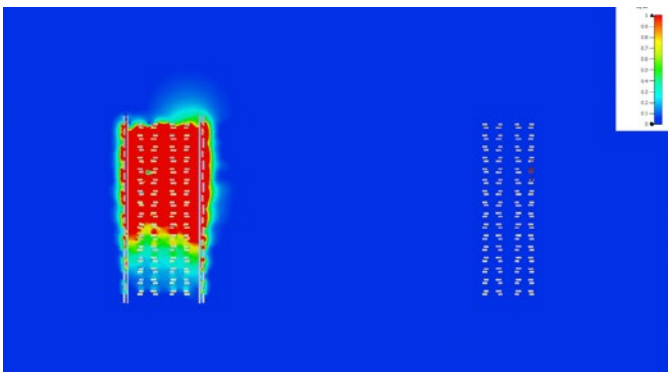
In the diagrams of the behavior of insertion loss, return loss, and crosstalk commonly used for data transmission, these geometric differences do not result in any major deviation, as can be seen in the adjacent insertion loss example.



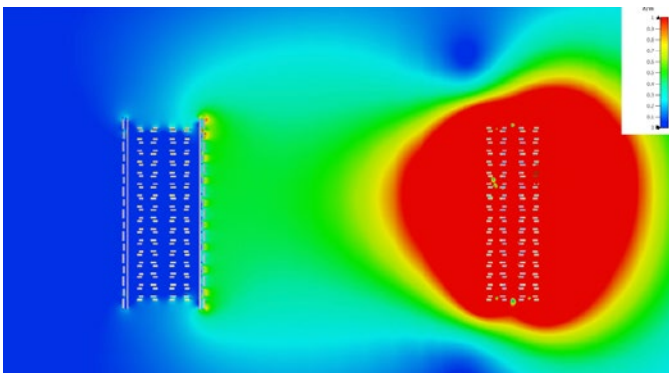
Insertion loss in comparison of shielded and unshielded board-to-board connection: FP 0,8/...-FV(-SH) 4,85 with FP 0,8/...-MV(-SH) 1,15, differential pair, 6.0 mm stack height

EMC and shielding

The shielded connectors have shield metal in longitudinal alignment with multiple solder feet at a 1.6 mm pitch. With a grounding of the outer contacts, 360° shielding is achieved. This can be seen in the illustration of the magnetic fields: The shielded design does not induce a field outside the shielding due to the internal high-frequency signal transmission, and the field of an external interfering signal does not propagate inside, thereby negatively influencing the signal quality. The unshielded version is different. To maintain a high level of immunity of the signal contacts to the environment, the effects shown require shielded PCB connectors in many applications. This protects sensitive signals or effectively inhibits the intensity of strong interference sources. The shields of the FP 0,8 series board-to-board connectors are made of a copper-nickel-tin alloy and are therefore non-magnetic. Because of this characteristic, they can be used in imaging evaluation systems, for example, such as magnetic resonance tomographs in the medical field.



Electromagnetic field for single-ended signal in the shielded version

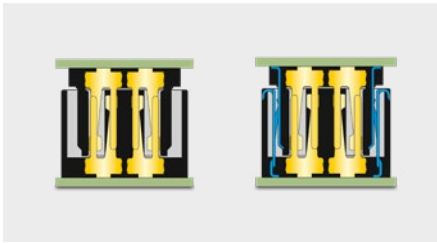


Electromagnetic field for single-ended signal in the unshielded version

FP 0,8 series – factors influencing data transmission

Geometry of the soldering surfaces

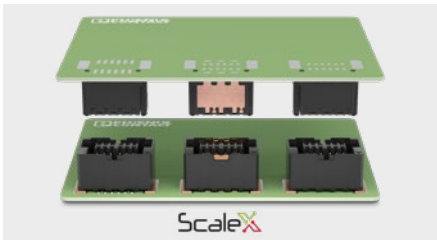
In addition to external factors such as the PCB layout and routing, there are also some factors influencing data transmission that are directly related to the board-to-board connector chosen. This includes, for example, the contact geometry. The FP 0,8 series features two signal contact versions. They differ in their soldering surfaces. Contacts with long soldering surfaces are used in the AOI versions. In comparison, the contacts of the shielded (SH) and the shield-free (SL) versions have shorter soldering surfaces. Despite the otherwise geometrically identical contacts, the data transmission properties of these FP 0,8 types differ.



Cross-section view of the FP 0,8-SL (left) and FP 0,8-SH (right)

Comparison of FP 0,8 versions

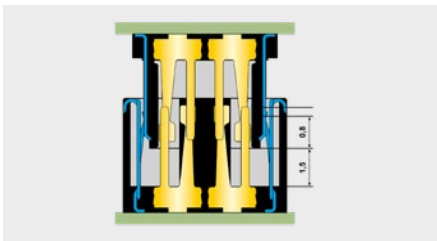
FP 0,8-SH and FP 0,8-SL use the same signal contacts and housings. The only difference is in the shielding available for FP 0,8-SH. This shields signals inside a plug-in connection against electromagnetic interference from outside the plug-in connection. The shielding plate influences the data transmission characteristics. Therefore, the data transmission properties of FP 0,8-SL and FP 0,8-SH are not identical.



FP 0,8 versions (unshielded AOI, shielded SH, unshielded SL)

Wipe length

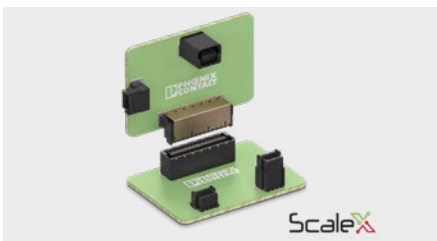
In addition to the contact geometry, the wipe length also affects the capabilities of a plug-in connection for data transmission. Wiping describes the property of pulling apart a plug connection by taking advantage of the contact overlap, starting from a fully mated state. A wipe length of up to 1.5 mm is permitted for the FP 0,8 product series. Pulling changes the geometry of the plug-in connection, which in turn affects the signal integrity.



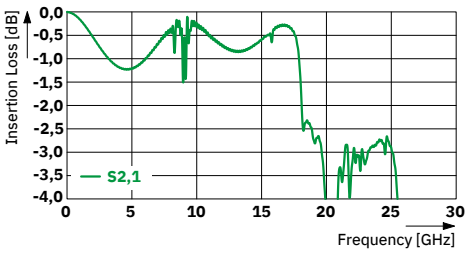
Wiping: ScaleX contact pulled by 1.5 mm

PCB orientation

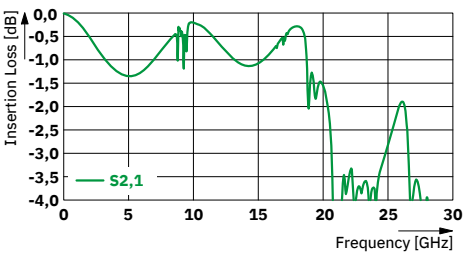
Even minor changes to the plug-in connection have an influence on the data transmission properties. It is therefore not surprising that the PCB orientation also has an influence. With the FP 0,8 series, mezzanine, coplanar, and mother-daughter card arrangements are possible. Mother-daughter card arrangements can be implemented either with a horizontal female connector strip and a vertical male connector strip or a horizontal male connector strip and a vertical female connector strip. Even these seemingly identical combinations are different in terms of their data transfer properties.



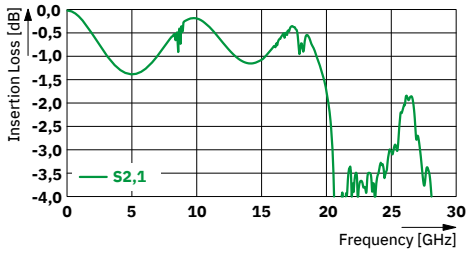
Example arrangement with angled board-to-board connection



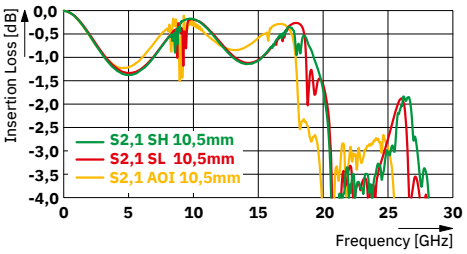
FP 0,8/...-MV 2,65 with FP 0,8/...-FV 7,85 +1.5 mm



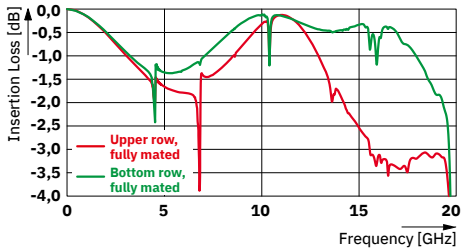
FP 0,8/...-MV-SL 2,65 with FP 0,8/...-FV-SL 7,85 +1.5 mm



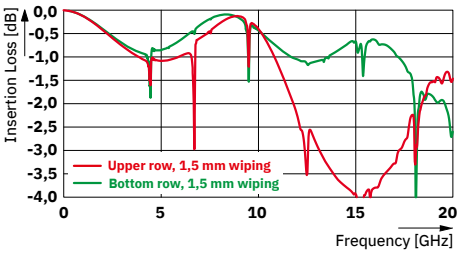
FP 0,8/...-MV-SH 2,65 with FP 0,8/...-FV-SH 7,85



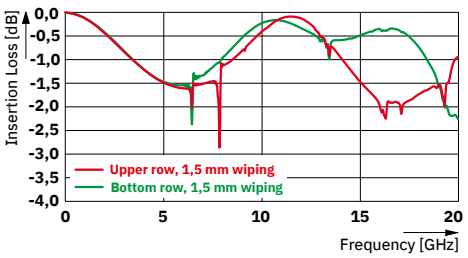
SL-AOI-SH in comparison – 10.5 mm stack height



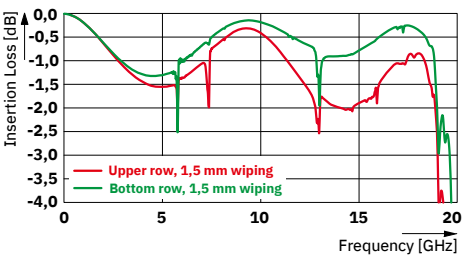
FP 0,8/...-FH-SH with FP 0,8/...-MH-SH



FP 0,8/...-FH-SH with FP 0,8/...-MH-SH



FP 0,8/...-FH-SH with FP 0,8/...-MV-SH 2,65



FP 0,8/...-FV-SH 7,85 with FP 0,8/...-MH-SH

FP 0,8 series – technical data

General technical data		Standards/note
Pitch	0.8 mm	
Numbers of positions	12, 20, 32, 52, 80	
EMC properties	Unshielded / shielded	
Data transmission speed	Up to 52 Gbps	
Nominal current at full 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
Tolerance compensation when plugged in	±0.3 mm (x/y direction)	
Test voltage	500 V AC	IEC 60512-4-1:2003
Rated voltage (I/1)	125 V	IEC 60664-1:2020
Rated surge voltage (I/1)	0.8 kV	IEC 60664-1:2020
Air clearances and creepage distances	Min. 0.25 mm	
Temperature limits during operation	-55°C … +125°C	
Insertion and withdrawal force per contact	≤1.2 N	
Approval	UL 1977 / CSA C22.2 No 182-3	
Environmental and durability tests		
Service life	500 insertion cycles, quality level I	IEC 60512-9-1:2010
Oscillation, sinusoidal	10 Hz … 2000 Hz, 20g	IEC 60512-6-4:2002
Contact interference during oscillation, sinusoidal	<1 µs	IEC 60512-2-5:2003
Shocks, half-sinusoidal	50g, 11 ms	IEC 60512-6-3:2002
Contact interference during shocks, half-sinusoidal	<1 µs	IEC 60512-2-5:2003
Shock and vibration tests for railway applications	Category 1 and 2 passed	IEC 61373
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, IIIb	
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	Based on IPC/JEDEC J-STD-020D.1:2008-03
Moisture sensitivity level	MSL 1	
Coplanarity	≤0.1 mm	
Packaging	Tape-on-reel	

FP 0,8 series – product overview

Web code: #2050

Shielded male connector strips (SH)

	Vertical								Horizontal	
										
	Base height 1.15 mm		Base height 2.65 mm		Base height 7.15 mm		Base height 8.65 mm			
Number of positions	Type	Item no.	Type	Item no.	Type	Item no.	Type	Item no.	Type	Item no.
12	FP 0,8/ 12-MV-SH 1,15	1043786	FP 0,8/12-MV-SH 2,65	1043731	FP 0,8/ 12-MV-SH 7,15	1154004	FP 0,8/ 12-MV-SH 8,65	1154119	FP 0,8/ 12-MH-SH	1043791
20	FP 0,8/ 20-MV-SH 1,15	1053586	FP 0,8/ 20-MV-SH 2,65	1053609	FP 0,8/ 20-MV-SH 7,15	1154005	FP 0,8/ 20-MV-SH 8,65	1154120	FP 0,8/ 20-MH-SH	1053615
32	FP 0,8/ 32-MV-SH 1,15	1043787	FP 0,8/ 32-MV-SH 2,65	1043733	FP 0,8/ 32-MV-SH 7,15	1154007	FP 0,8/ 32-MV-SH 8,65	1154121	FP 0,8/ 32-MH-SH	1043792
52	FP 0,8/ 52-MV-SH 1,15	1043789	FP 0,8/ 52-MV-SH 2,65	1043756	FP 0,8/ 52-MV-SH 7,15	1154008	FP 0,8/ 52-MV-SH 8,65	1154122	FP 0,8/ 52-MH-SH	1043793
80	FP 0,8/ 80-MV-SH 1,15	1043790	FP 0,8/ 80-MV-SH 2,65	1043757	FP 0,8/ 80-MV-SH 7,15	1154011	FP 0,8/ 80-MV-SH 8,65	1154123	FP 0,8/ 80-MH-SH	1043794

Shielded female connector strips (SH)

	Vertical						Horizontal	
								
	Installed height 4.85 mm		Installed height 7.85 mm		Installed height 10.85 mm			
Number of positions	Type	Item no.	Type	Item no.	Type	Item no.	Type	Item no.
12	FP 0,8/ 12-FV-SH 4,85	1043710	FP 0,8/12-FV-SH 7,85	1043682	FP 0,8/12-FV-SH 10,85	1154031	FP 0,8/ 12-FH-SH	1043722
20	FP 0,8/ 20-FV-SH 4,85	1053612	FP 0,8/ 20-FV-SH 7,85	1053614	FP 0,8/ 20-FV-SH 10,85	1154032	FP 0,8/ 20-FH-SH	1053616
32	FP 0,8/ 32-FV-SH 4,85	1043711	FP 0,8/ 32-FV-SH 7,85	1043683	FP 0,8/ 32-FV-SH 10,85	1154033	FP 0,8/ 32-FH-SH	1043723
52	FP 0,8/ 52-FV-SH 4,85	1043713	FP 0,8/ 52-FV-SH 7,85	1043684	FP 0,8/ 52-FV-SH 10,85	1154034	FP 0,8/ 52-FH-SH	1043724
80	FP 0,8/ 80-FV-SH 4,85	1043714	FP 0,8/ 80-FV-SH 7,85	1043685	FP 0,8/ 80-FV-SH 10,85	1154035	FP 0,8/ 80-FH-SH	1043725

FP 0,8 series – product overview

Web code: #3684

Shield-free male connector strips (SL)

	Vertical								Horizontal	
										
	Base height 1.15 mm		Base height 2.65 mm		Base height 7.15 mm		Base height 8.65 mm			
Number of positions	Type	Item no.	Type	Item no.	Type	Item no.	Type	Item no.	Type	Item no.
12	FP 0,8/ 12-MV-SL 1,15	1569578	FP 0,8/ 12-MV-SL 2,65	1569383	FP 0,8/ 12-MV-SL 7,15	1569557	FP 0,8/ 12-MV-SL 8,65	1569624	FP 0,8/ 12-MH-SL	1575924
20	FP 0,8/ 20-MV-SL 1,15	1569580	FP 0,8/ 20-MV-SL 2,65	1569387	FP 0,8/ 20-MV-SL 7,15	1569558	FP 0,8/ 20-MV-SL 8,65	1569625	FP 0,8/ 20-MH-SL	1575926
32	FP 0,8/ 32-MV-SL 1,15	1569583	FP 0,8/ 32-MV-SL 2,65	1569390	FP 0,8/ 32-MV-SL 7,15	1569560	FP 0,8/ 32-MV-SL 8,65	1569626	FP 0,8/ 32-MH-SL	1575927
52	FP 0,8/ 52-MV-SL 1,15	1569586	FP 0,8/ 52-MV-SL 2,65	1569392	FP 0,8/ 52-MV-SL 7,15	1569561	FP 0,8/ 52-MV-SL 8,65	1569627	FP 0,8/ 52-MH-SL	1575930
80			FP 0,8/ 80-MV-SL 2,65	1569396	FP 0,8/ 80-MV-SL 7,15	1569563	FP 0,8/ 80-MV-SL 8,65	1569631	FP 0,8/ 80-MH-SL	1575931

Shield-free female connector strips (SL)

	Vertical					
						
	Installed height 4.85 mm		Installed height 7.85 mm		Installed height 10.85 mm	
Number of positions	Type	Item no.	Type	Item no.	Type	Item no.
12	FP 0,8/ 12-FV-SL 4,85	1545216	FP 0,8/ 12-FV-SL 7,85	1545345	FP 0,8/ 12-FV-SL 10,85	1545371
20	FP 0,8/ 20-FV-SL 4,85	1545219	FP 0,8/ 20-FV-SL 7,85	1545346	FP 0,8/ 20-FV-SL 10,85	1545372
32	FP 0,8/ 32-FV-SL 4,85	1545310	FP 0,8/ 32-FV-SL 7,85	1545347	FP 0,8/ 32-FV-SL 10,85	1545374
52	FP 0,8/ 52-FV-SL 4,85	1545311	FP 0,8/ 52-FV-SL 7,85	1545348	FP 0,8/ 52-FV-SL 10,85	1545376
80	FP 0,8/ 80-FV-SL 4,85	1545313	FP 0,8/ 80-FV-SL 7,85	1545349	FP 0,8/ 80-FV-SL 10,85	1545378

Compatible PCB footprints

The FP 0,8-SL product family includes shield-free vertical male and female connector strips in the usual heights. These must be processed with PCB footprints that are compatible with the shielded versions. This means that shielded and shield-free versions can be replaced at any time without having to adjust the PCB layout.

FP 0,8 series – product overview

Web code: #2330

Unshielded male connector strips (AOI)

	Vertical								Horizontal	
										
	Base height 1.15 mm		Base height 2.65 mm		Base height 7.15 mm		Base height 8.65 mm			
Number of positions	Type	Item no.	Type	Item no.	Type	Item no.	Type	Item no.	Type	Item no.
12	FP 0,8/ 12-MV 1,15	1061725	FP 0,8/ 12-MV 2,65	1061696	FP 0,8/ 12-MV 7,15	1154017	FP 0,8/ 12-MV 8,65	1154012	FP 0,8/ 12-MH	1104548
20	FP 0,8/ 20-MV 1,15	1061727	FP 0,8/ 20-MV 2,65	1061697	FP 0,8/ 20-MV 7,15	1154018	FP 0,8/ 20-MV 8,65	1154013	FP 0,8/ 20-MH	1104549
32	FP 0,8/ 32-MV 1,15	1061728	FP 0,8/ 32-MV 2,65	1061698	FP 0,8/ 32-MV 7,15	1154022	FP 0,8/ 32-MV 8,65	1154014	FP 0,8/ 32-MH	1104550
52	FP 0,8/ 52-MV 1,15	1061729	FP 0,8/ 52-MV 2,65	1061700	FP 0,8/ 52-MV 7,15	1154023	FP 0,8/ 52-MV 8,65	1154015	FP 0,8/ 52-MH	1104551
80	FP 0,8/ 80-MV 1,15	1061730	FP 0,8/ 80-MV 2,65	1061704	FP 0,8/ 80-MV 7,15	1154024	FP 0,8/ 80-MV 8,65	1154016	FP 0,8/ 80-MH	1104552

Unshielded female connector strips (AOI)

	Vertical						Horizontal	
								
	Installed height 4.85 mm		Installed height 7.85 mm		Installed height 10.85 mm			
Number of positions	Type	Item no.	Type	Item no.	Type	Item no.	Type	Item no.
12	FP 0,8/ 12-FV 4,85	1061643	FP 0,8/ 12-FV 7,85	1061580	FP 0,8/ 12-FV 10,85	1154128	FP 0,8/ 12-FH	1104540
20	FP 0,8/ 20-FV 4,85	1061660	FP 0,8/ 20-FV 7,85	1061583	FP 0,8/ 20-FV 10,85	1154075	FP 0,8/ 20-FH	1104541
32	FP 0,8/ 32-FV 4,85	1061662	FP 0,8/ 32-FV 7,85	1061584	FP 0,8/ 32-FV 10,85	1154076	FP 0,8/ 32-FH	1104542
52	FP 0,8/ 52-FV 4,85	1061666	FP 0,8/ 52-FV 7,85	1061585	FP 0,8/ 52-FV 10,85	1154077	FP 0,8/ 52-FH	1104543
80	FP 0,8/ 80-FV 4,85	1061667	FP 0,8/ 80-FV 7,85	1061586	FP 0,8/ 80-FV 10,85	1154078	FP 0,8/ 80-FH	1104544

Many possible applications

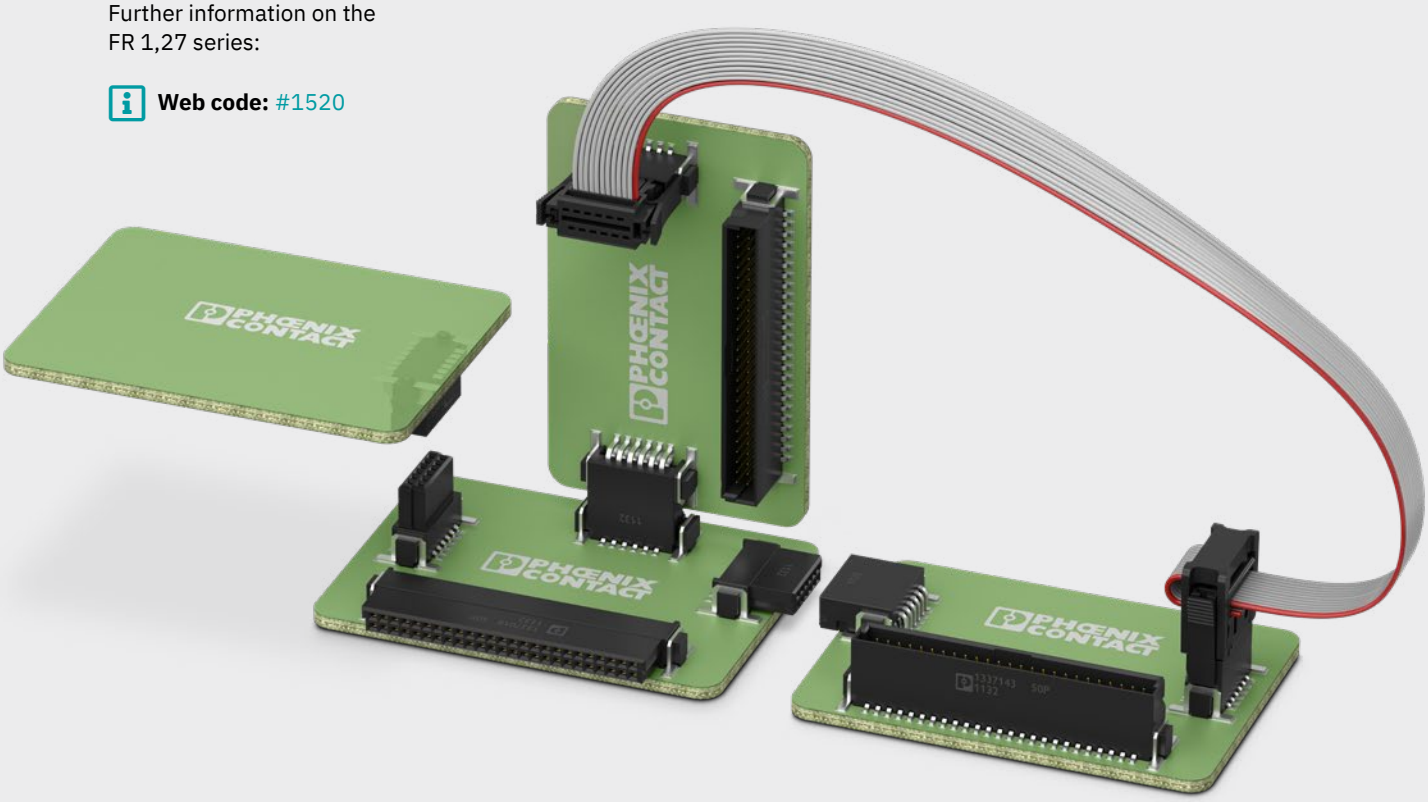
Whether shielded. shield-free, or unshielded, vertical or horizontal alignment, small or large stack height, low or high number of positions. The FP 0,8 series has the right solution for every application.

FR 1,27: your speed advantage in a 1.27 mm pitch

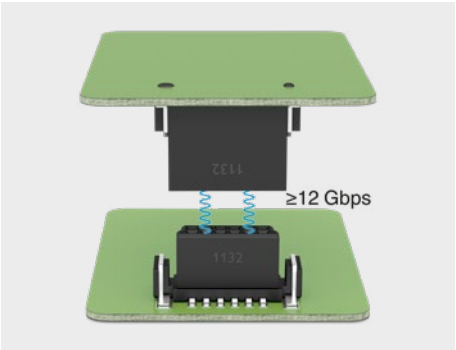
High-speed data transmission and time savings in the development process make a real difference. With the FR series board-to-board connectors with a pitch of 1.27 mm, Phoenix Contact provides data rates up to 28 Gbps and customer-specific simulations for data integrity.

Further information on the FR 1,27 series:

Web code: #1520

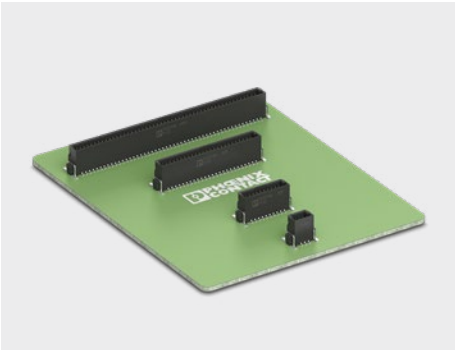


FR 1,27 series – advantages at a glance



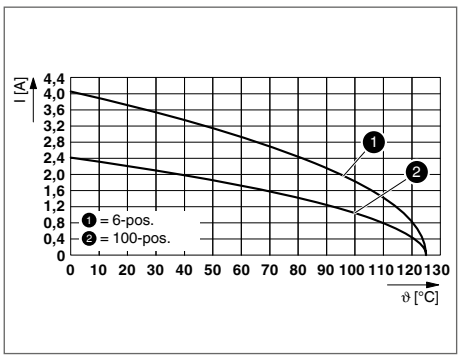
High-speed data

The first high-speed data transmission at up to 28 Gbps in the established market standard offers new design possibilities.



Variety

Robust 6-pos. to 100-pos. board-to-board and wire-to-board connectors provide greater flexibility in component options.



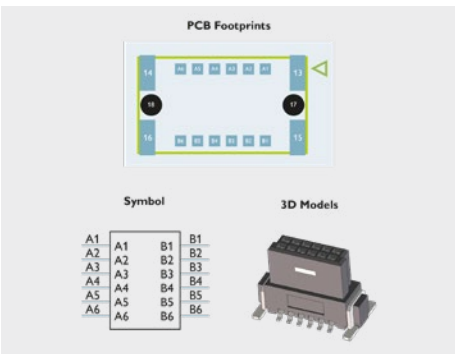
Quality in detail

Gold-plated contact points enable long-term stable signal transmission and currents up to 2.3 A.



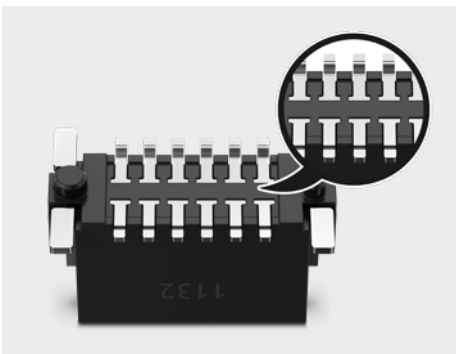
Simulation service

Time savings during the development process with customer-specific simulations for data integrity.



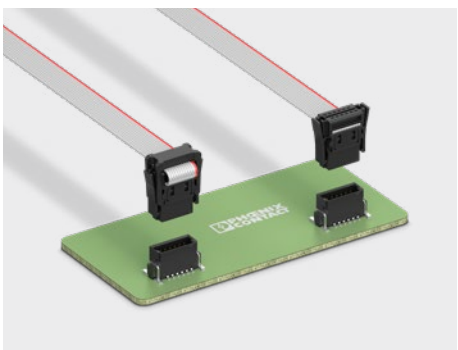
Design-in support

Benefit from the comprehensive service and support with MCAD and ECAD data as well as our sample service.



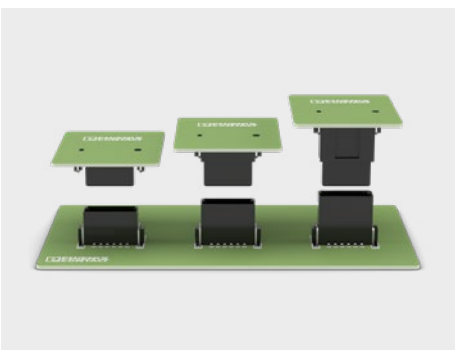
Processed reliably

Positioning pins on the underside and a coplanarity of ≤0.1 mm ensure secure positioning and subsequent soldering on the PCB.



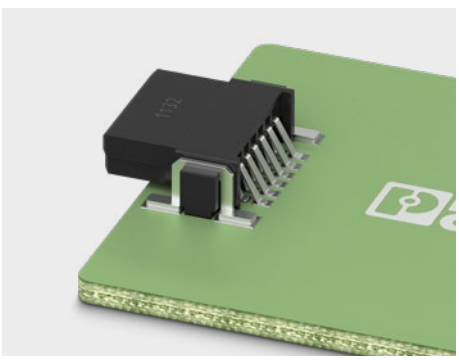
Vibration-resistant male connector

Latching on both sides of the IDC connector prevents connections from coming loose due to vibrations – optionally available with strain relief.



Flexible device design

A total of eleven different numbers of positions from 8 to 20 mm enable a great deal of freedom for the device design.



Stable and robust

Stable signal contacts and armature metals enable a robust PCB connection designed for a maximum of 500 plug and unplug cycles.

FR 1,27 series – installation instructions

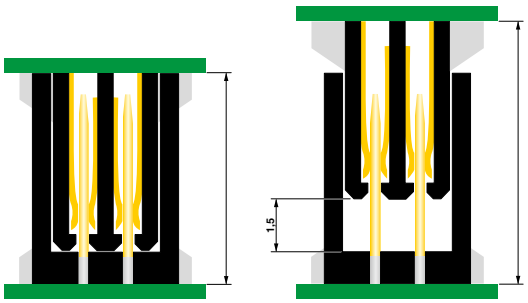
Stack heights

The stack height describes the clearance between two PCBs overlapping in parallel (mezzanine arrangement). You can use vertical versions of the female and male connector strips to reliably connect PCBs. With their wipe length of 1.5 mm, the PCB connectors are ideal for a continuous range of stack heights between 8 and 13.8 mm. An extension to the portfolio to include stack heights up to 20 mm is in preparation.

The female connector strip is fully inserted into the male connector strip with the respective minimum PCB spacing. To achieve the maximum PCB spacing, 1.5 mm of the male contact remains outside the contact zone. At the same time, a reliable contact overlap of at least 0.9 mm is ensured at all times.

Stack height	Male connector strip	Female connector strip
8.0 mm ... 9.5 mm	FR 1,27/...-MV 1,75	FR 1,27/...-FV 6,25
9.5 mm ... 11.0 mm	FR 1,27/...-MV 3,25	FR 1,27/...-FV 6,25
10.8 mm ... 12.3 mm	FR 1,27/...-MV 1,75	FR 1,27/...-FV 9,05
12.3 mm ... 13.8 mm	FR 1,27/...-MV 3,25	FR 1,27/...-FV 9,05
13.9 mm² ... 15.4 mm²	FR 1,27/...-MV 4,85	FR 1,27/...-FV 9,05
15.4 mm² ... 16.9 mm²	FR 1,27/...-MV 1,75	FR 1,27/...-FV 13,65
16.9 mm² ... 18.4 mm²	FR 1,27/...-MV 3,25	FR 1,27/...-FV 13,65
18.5 mm² ... 20.0 mm²	FR 1,27/...-MV 4,85	FR 1,27/...-FV 13,65

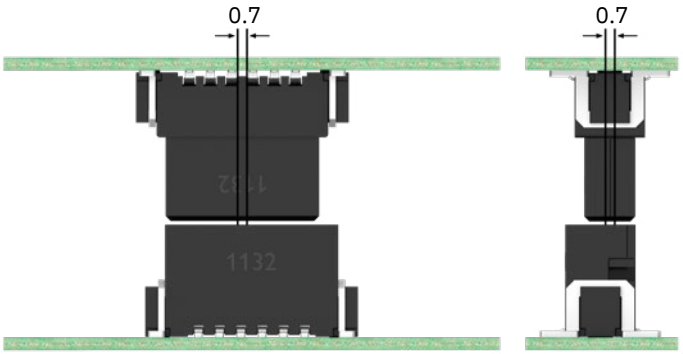
* In preparation



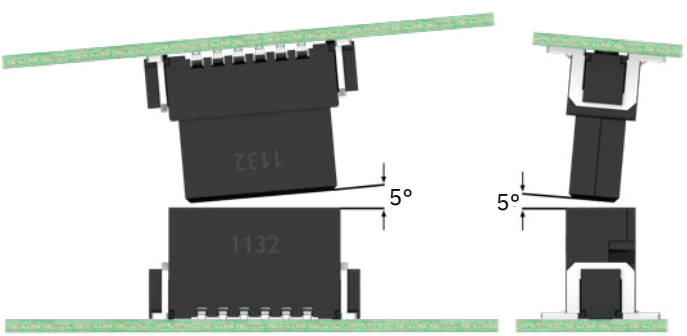
Minimum PCB spacing (left) and maximum PCB spacing (right) due to the wipe length

Tolerance compensation

During the plugging process, the connectors have a position tolerance of ±0.7 mm in the longitudinal and transverse directions. The geometry also enables an inclination tolerance of ±5° when connecting. These flexible tolerance compensations enable a flexible design of the PCB arrangement.



Center offset when plugging in

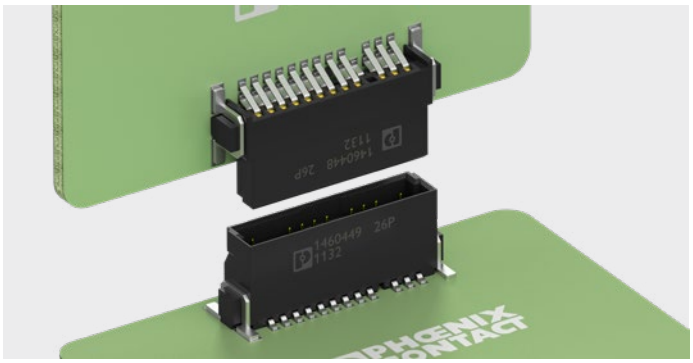


Inclination tolerance when connecting

Variance

The board-to-board connectors of the FR 1,27 series are also available in customer-specific versions on request, in addition to the standard items listed in the product overview. For example, partial assemblies are possible for the angled and straight male and female connector strips that may be required in some applications, for example, to increase the air clearances and creepage distances.

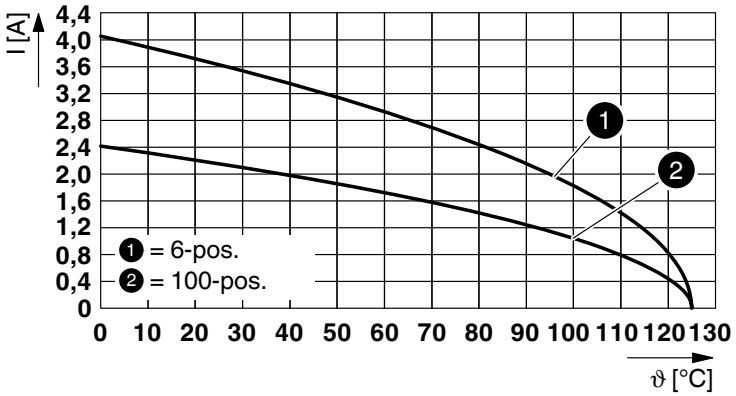
Hot-swapping capability with the last make, first break contacts. Last make, first break contacts are realized by pins in the male connector strips, which are 0.4 mm shorter. This ensures that a defined sequence of ground and signal contacts is maintained during plugging and unplugging, making a changeover possible when operating with first make, last break reference potential equalization. With the generous contact overlap of a total of 2.4 mm (1.5 mm wipe + 0.9 mm contact reliability), reliable contacting is ensured even for last make, first break contacts, i.e., contacts that are 0.4 mm shorter.



Example of an orthogonal board-to-board connection with partially assembled and shorter contacts

Improved item properties

The improved product properties of the FR 1,27 series enable use in numerous applications. The adjacent diagram compares the current transmission behavior of FR 1,27 as an example. Depending on the number of positions, a current of up to 3.7 A per contact is possible (current carrying capacity test with full current of a 6-position board-to-board connection). The nominal current for FR 1,27 is 2.3 A per contact. In addition, the new FR 1,27 product line is suitable for high-speed data transmission of up to 28 Gbps (see next page). This sets it far apart from the other commercially available solutions from other manufacturers on the market. They are fully compatible with equivalent products offered by relevant market competitors. Corresponding test reports are available on request.

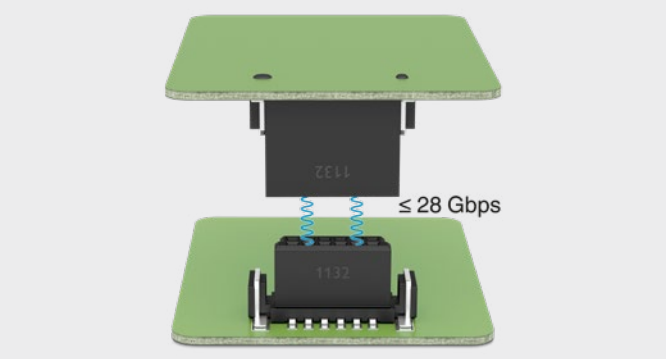


Derating diagram with comparison of largest and smallest number of positions for FR 1,27

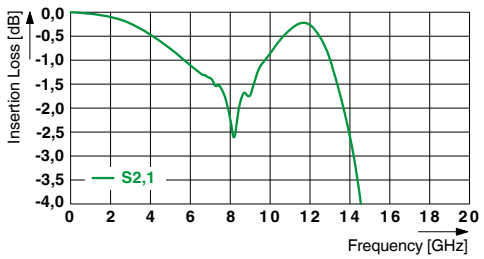
FR 1,27 series – data transmission properties

High-speed data transmission

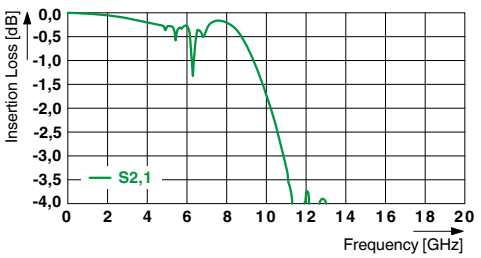
The new FR 1,27 series is ideally suited for high-speed data transmissions up to 28 Gbps. Excellent signal integrity is achieved even at high frequencies up to 14 GHz. The following diagrams illustrate the data transmission properties of the smallest and largest possible stack height in assignments with differential pairs and ground pins in the following order per contact row: G, S, S, G, S, S, G. Further diagrams as well as S-parameters for own simulations are available on request.



Insertion loss

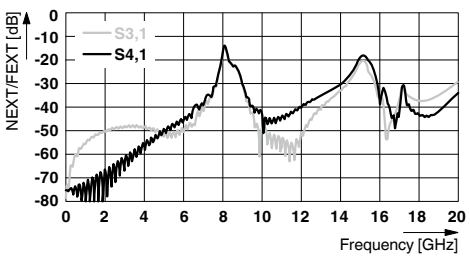


FR 1,27/...-FV 6,25 with FR 1,27/...-MV 1,75, differential pair, 8.0 mm stack height

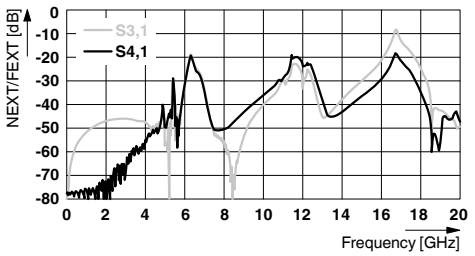


FR 1,27/...-FV 9,05 with FR 1,27/...-MV 3,25, differential pair, 13.8 mm stack height

Crosstalk

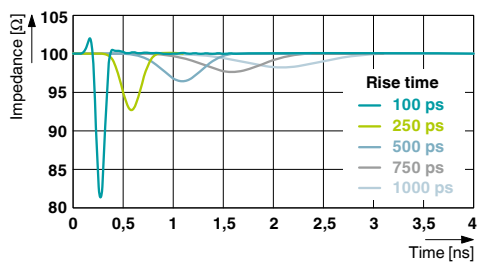


FR 1,27/...-FV 6,25 with FR 1,27/...-MV 1,75, differential pair, 8.0 mm stack height

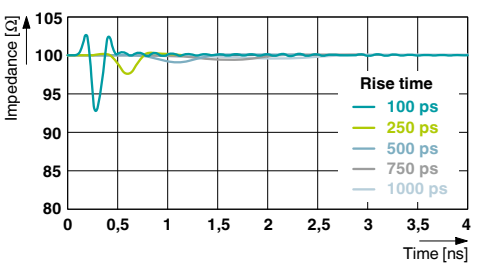


FR 1,27/...-FV 9,05 with FR 1,27/...-MV 3,25, differential pair, 13.8 mm stack height

Impedance



FR 1,27/...-FV 6,25 with FR 1,27/...-MV 1,75, differential pair, 8.0 mm stack height



FR 1,27/...-FV 9,05 with FR 1,27/...-MV 3,25, differential pair, 13.8 mm stack height

FR 1,27 series – technical data

General technical data		Standards/note
Pitch	1.27 mm	
Numbers of positions board-to-board	6, 10, 12, 16, 20, 26, 32, 40, 50, 68, 80, 100	
Numbers of positions wire-to-board	12, 16, 20, 26, 32, 40, 50, 68, 80	
Data transmission speed	Up to 28 Gbps	Wire-to-board up to 1 Gbps
Nominal current at full current, 50-pos. (at 20°C)	2.3 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
Rated voltage (I/1)	160 V	IEC 60664-1:2020
Rated surge voltage (I/1)	0.8 kV	IEC 60664-1:2020
Air clearances and creepage distances	Min. 0.4 mm	
Temperature limits during operation	-55°C … +125°C	
Insertion and withdrawal force per contact	Approx. 0.5 N	
Approval	UL 1977 / CSA C22.2 No 182-3	
Environmental and durability tests		
Service life	500 insertion cycles, quality level I	IEC 60512-9-1:2010
Oscillation, sinusoidal	10 Hz … 2000 Hz, 20g	IEC 60512-6-4:2002
Contact interference during oscillation, sinusoidal	<1 µs	IEC 60512-2-5:2003
Shocks, half-sinusoidal	50g, 11 ms	IEC 60512-6-3:2002
Contact interference during shocks, half-sinusoidal	<1 µs	IEC 60512-2-5:2003
Shock and vibration tests for railway applications	Category 1 and 2 passed	IEC 61373
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, IIIb	
Resistance to creepage	CTI 150	DIN EN 60112 (VDE 0303-11)
Flammability rating in accordance with UL 94	V0	
Processing note		
Process	SMD soldering	Based on 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	

FR 1,27 series – product overview: male connector strips

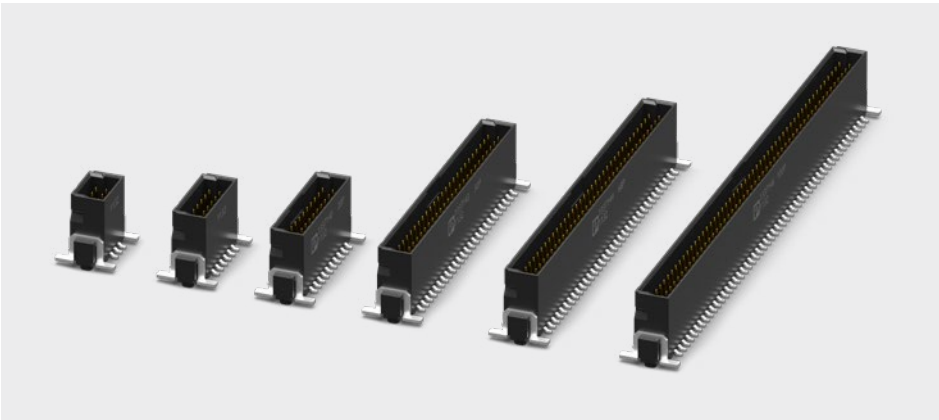
Web code: #1520

Male connector strip						
	Vertical				Horizontal	
						
	Base height 1.75 mm		Base height 3.25 mm			
Number of positions	Type	Item no.	Type	Item no.	Type	Item no.
6	FR 1,27/ 6-MV 1,75	1373826	FR 1,27/ 6-MV 3,25	1337137	FR 1,27/ 6-MH	1377295
10	-	-	FR 1,27/10-MV 3,25	1734670	-	-
12	FR 1,27/ 12-MV 1,75	1373827	FR 1,27/ 12-MV 3,25	1337138	FR 1,27/ 12-MH	1377297
16	FR 1,27/ 16-MV 1,75	1373828	FR 1,27/ 16-MV 3,25	1337139	FR 1,27/ 16-MH	1377298
20	FR 1,27/ 20-MV 1,75	1373866	FR 1,27/ 20-MV 3,25	1337140	FR 1,27/ 20-MH	1377299
26	FR 1,27/ 26-MV 1,75	1373883	FR 1,27/ 26-MV 3,25	1337141	FR 1,27/ 26-MH	1377300
32	FR 1,27/ 32-MV 1,75	1373886	FR 1,27/ 32-MV 3,25	1337147	FR 1,27/ 32-MH	1377301
40	FR 1,27/ 40-MV 1,75	1373887	FR 1,27/ 40-MV 3,25	1337142	FR 1,27/ 40-MH	1377302
50	FR 1,27/ 50-MV 1,75	1373889	FR 1,27/ 50-MV 3,25	1337143	FR 1,27/ 50-MH	1377303
68	FR 1,27/ 68-MV 1,75	1373892	FR 1,27/ 68-MV 3,25	1337144	FR 1,27/ 68-MH	1377304
80	FR 1,27/ 80-MV 1,75	1373894	FR 1,27/ 80-MV 3,25	1337145	FR 1,27/ 80-MH	1377305
100	FR 1,27/100-MV 1,75	1373896	FR 1,27/100-MV 3,25	1337146	FR 1,27/100-MH	1377306

Numbers of positions

The double-row board-to-board connectors are available with the following numbers of positions: 6, 10, 12, 16, 20, 26, 32, 40, 50, 68, 80, and 100. Other numbers of positions between 6 and 100-pos., in increments of 2, are also available on request. The number of positions corresponds to the total number of contacts.

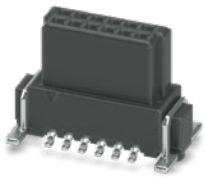
Example: A 12-position item has six contacts per row. On all FR 1,27 series products, position 1 is marked with an arrow.



Various numbers of positions from 6 to 100

FR 1,27 series – product overview: female connector strips

Web code: #1520

Female connector strip						
	Vertical				Horizontal	
						
	Installed height: 6.25 mm		Installed height: 9.05 mm			
Number of positions	Type	Item no.	Type	Item no.	Type	Item no.
6	FR 1,27/ 6-FV 6,25	1374026	FR 1,27/ 6-FV 9,05	1374872	FR 1,27/ 6-FH	1337009
10	-	-	-	-	FR 1,27/10-FH	1734668
12	FR 1,27/ 12-FV 6,25	1374027	FR 1,27/ 12-FV 9,05	1374873	FR 1,27/ 12-FH	1337010
16	FR 1,27/ 16-FV 6,25	1374028	FR 1,27/ 16-FV 9,05	1374874	FR 1,27/ 16-FH	1337011
20	FR 1,27/ 20-FV 6,25	1374029	FR 1,27/ 20-FV 9,05	1374875	FR 1,27/ 20-FH	1337012
26	FR 1,27/ 26-FV 6,25	1374030	FR 1,27/ 26-FV 9,05	1374877	FR 1,27/ 26-FH	1337013
32	FR 1,27/ 32-FV 6,25	1374031	FR 1,27/ 32-FV 9,05	1374879	FR 1,27/ 32-FH	1337014
40	FR 1,27/ 40-FV 6,25	1374032	FR 1,27/ 40-FV 9,05	1374880	FR 1,27/ 40-FH	1337015
50	FR 1,27/ 50-FV 6,25	1374033	FR 1,27/ 50-FV 9,05	1374881	FR 1,27/ 50-FH	1337018
68	FR 1,27/ 68-FV 6,25	1374034	FR 1,27/ 68-FV 9,05	1374882	FR 1,27/ 68-FH	1337019
80	FR 1,27/ 80-FV 6,25	1374036	FR 1,27/ 80-FV 9,05	1374883	FR 1,27/ 80-FH	1337020
100	FR 1,27/100-FV 6,25	1374037	FR 1,27/100-FV 9,05	1374884	FR 1,27/ 100-FH	1337021

High degree of flexibility

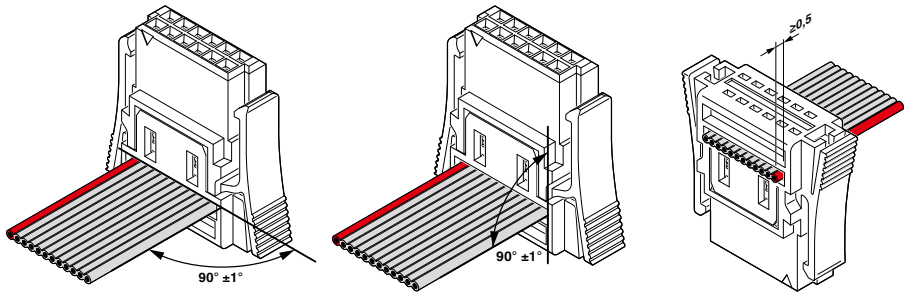
If the number of positions matches, any male connector strip can be combined with any female connector strip. The high-position PCB connectors with 1.27 mm pitch are compatible with the layouts and connections of existing systems on the market.

Corresponding compatibility reports are available on request.

FR 1,27 series – IDC female connector strip designed for assembly

Self-assembly of IDC female connector strips

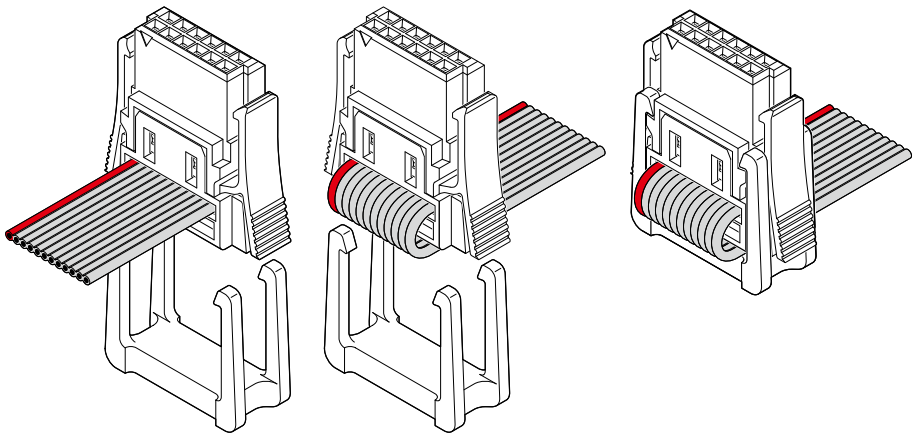
Two printed circuit boards can be connected flexibly using the FR 1,27/... IDC female connector strips and a connected flat-ribbon cable. For self-assembly, refer to the instructions for use. These can be found online for download under the IDC female connector strip items. This information describes stop parameters such as stop force and travel as well as the alignment of the flat-ribbon cable.



Alignment of the flat-ribbon cable to the IDC female connector strip in the x, y, and z directions (for details, see application note)

Attaching the optional strain relief

Optionally, strain relief can be attached to the assembled IDC female connector strip. The mounted flat-ribbon cable is routed 180° to the rear. The strain relief is then attached and snapped into place.



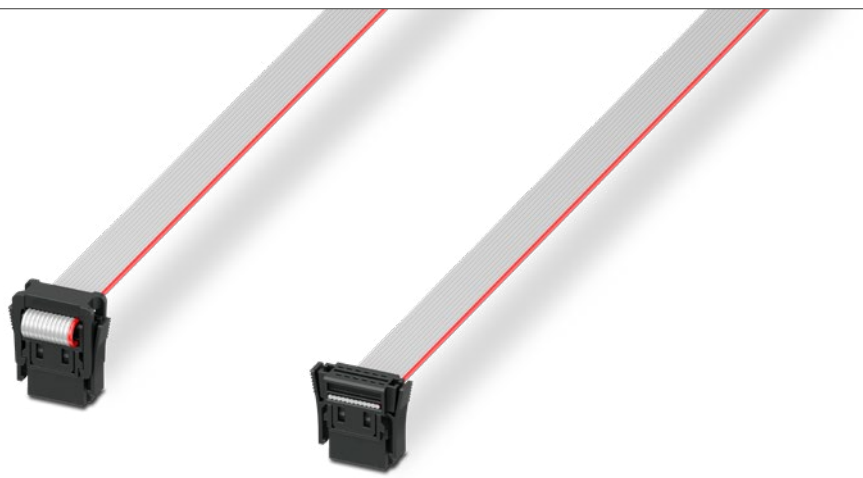
Steps for mounting the strain relief

Suitable cables

The IDC female connector strip is released with the following cables:

- Manufacturer: Klasing Kabel
- 30 AWG (0.06 mm²)
- 0.635 mm pitch
- 7 x 0.102 mm individual litz wires

If a different cable is used, its compatibility with the FR 1,27 IDC female connector strip should be checked and a function test carried out.



IDC female connector strip



Number of positions	Type	Item no.
12	FR 1,27/ 12-FWL	1378542
16	FR 1,27/ 16-FWL	1378544
20	FR 1,27/ 20-FWL	1378546
26	FR 1,27/ 26-FWL	1378548
32	FR 1,27/ 32-FWL	1378549
40	FR 1,27/ 40-FWL	1378550
50	FR 1,27/ 50-FWL	1378551
68	FR 1,27/ 68-FWL	1378553
80	FR 1,27/ 80-FWL	1378554

Sample assemblies



Number of positions	Type	Item no.
12	SAMPLE FR 1,27/ 12-FWL-11/ P/ 0,1	1508260
16	SAMPLE FR 1,27/ 16-FWL-11/ P/ 0,1	1508261
20	SAMPLE FR 1,27/ 20-FWL-11/ P/ 0,1	1508262
26	SAMPLE FR 1,27/ 26-FWL-11/ P/ 0,1	1508265
32	SAMPLE FR 1,27/ 32-FWL-11/ P/ 0,1	1508267
40	SAMPLE FR 1,27/ 40-FWL-11/ P/ 0,1	1508269
50	SAMPLE FR 1,27/ 50-FWL-11/ P/ 0,1	1508270
68	SAMPLE FR 1,27/ 68-FWL-11/ P/ 0,1	1508272
80	SAMPLE FR 1,27/ 80-FWL-11/ P/ 0,1	1508273

Strain relief

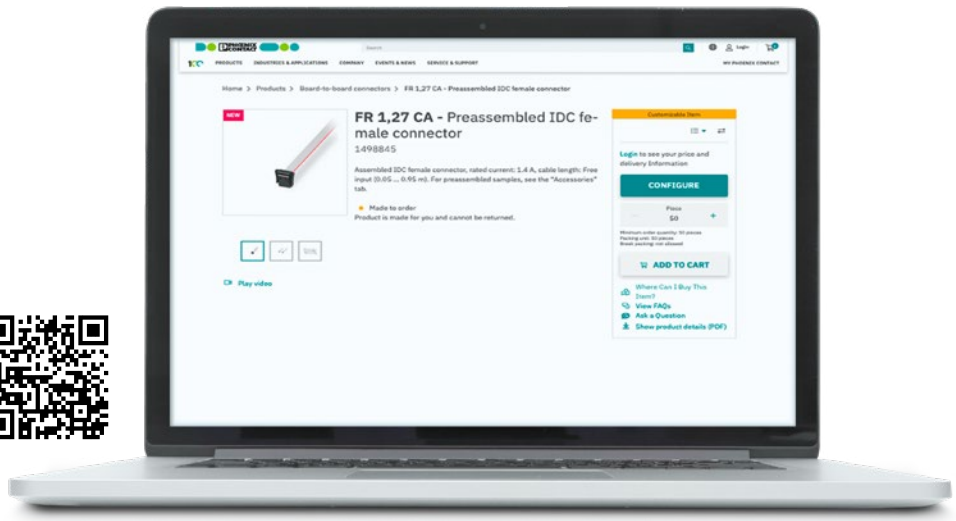


Number of positions	Type	Item no.
12	FR 1,27/ 12-SR	1399640
16	FR 1,27/ 16-SR	1399641
20	FR 1,27/ 20-SR	1399642
26	FR 1,27/ 26-SR	1399643
32	FR 1,27/ 32-SR	1399645
40	FR 1,27/ 40-SR	1399646
50	FR 1,27/ 50-SR	1399647
68	FR 1,27/ 68-SR	1399648
80	FR 1,27/ 80-SR	1399649

FR 1,27 series – configurator for assembled IDC female connector strips

Configurator for FR 1,27 cable assemblies

In addition to the option of purchasing IDC female connector strips individually, it is also possible to use our configurator for FR 1,27 cable assemblies. The configurator offers graphical support so you can configure and order your individual cable assemblies. To do this, search for item number 1498845 or the item designation FR 1,27 CA in the search bar on our website, phoenixcontact.com. On the item details page you will find, among other things, technical drawings and information on the item approvals. On the right-hand side, next to the product photo and the basic information, you will find a button labeled “Configure”. Click on this button to be redirected to our configurator.

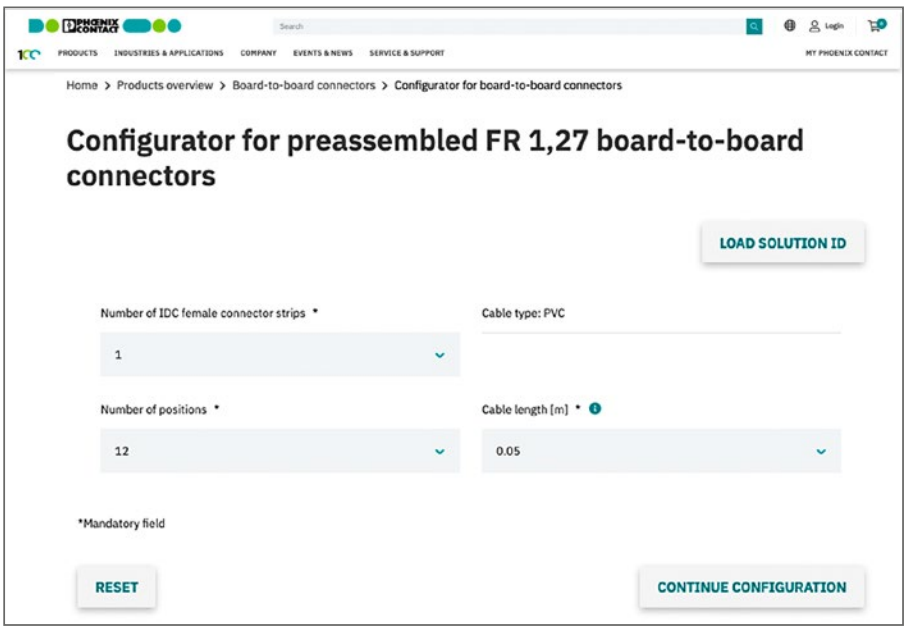


Item detail page – item no. 1498845, FR 1,27 CA

Step 1: Basic data, solution ID

Start the configuration process by clicking on the “Configure” button. Here you have the option of loading an existing configuration using “Solution ID”. This five-digit alphanumeric character combination is displayed at the end of the configuration process.

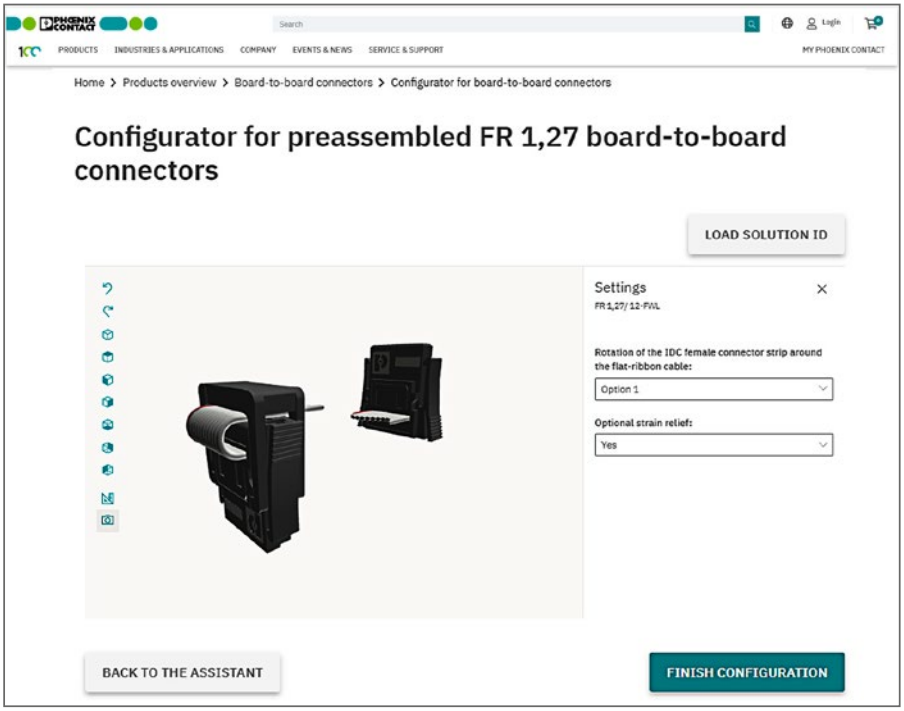
If you want to create a new configuration, you can use the drop-down menus displayed to specify the number of IDC female connector strips, the number of positions, and the cable length. An i symbol, such as the one displayed for the cable length, contains additional information that you can obtain by moving the cursor over the symbol. The “Reset selection” button resets all entries to the initial values. Clicking on “Continue configuration” takes you to the next step of the process.



Step 2: Detailed configuration

In the second step of the configuration, you will see a 3D view of the item you have configured, which you can rotate or zoom as desired using the buttons on the left and your cursor. Click on the camera symbol to return to the initial view of the item.

Click on the connector you want to change and a cogwheel symbol will appear. Another click on the cogwheel symbol opens a configuration window on the right-hand side of the 3D view. Here you have the option of rotating the connector and adding the optional strain relief to your configuration. Once you have customized the model to your requirements, click on the “Complete configuration” button to proceed to the final step of the configuration process.



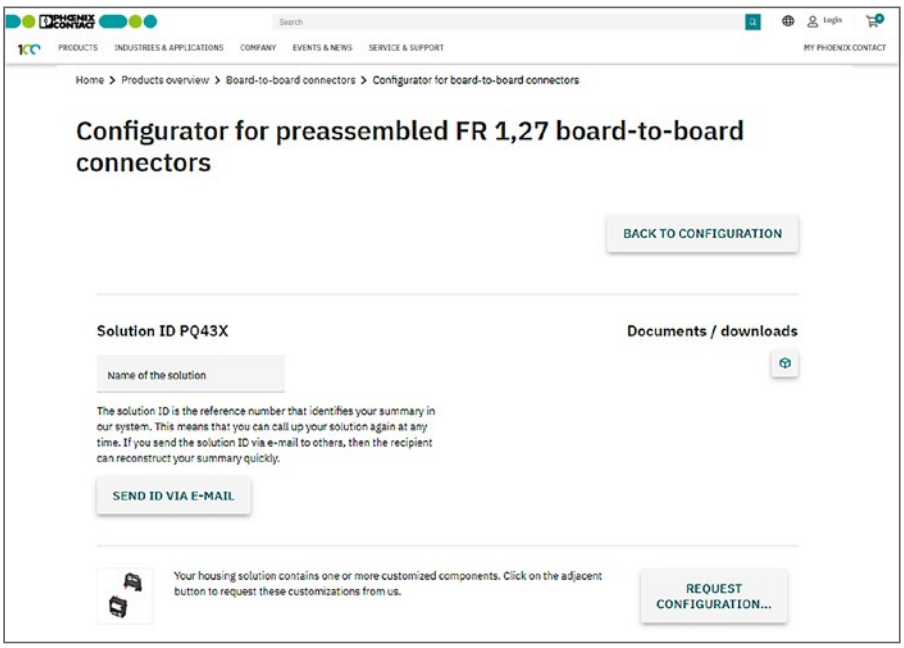
Step 3: Finalizing the configuration

The last step of the configuration takes you to an overview page. From here, you can return to the configuration process by clicking on the “Back to configuration” button.

You will also receive your solution ID here, which you can use to call up the configuration you have just created again at any time.

2D and 3D models of your configuration are available for you to download in the download area. Choose from a large selection of relevant file formats.

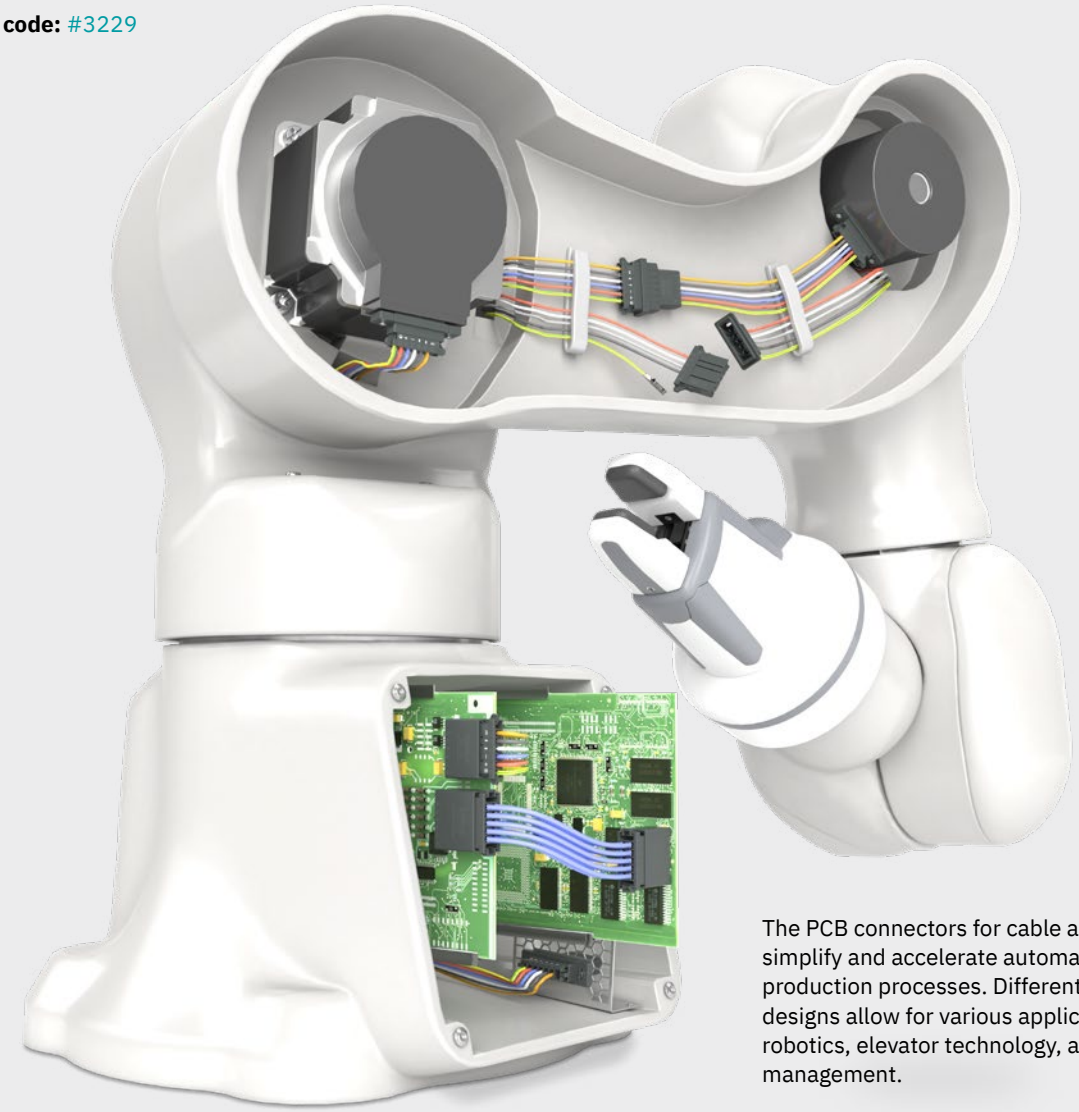
If you have any questions about the specific ordering process, please contact our sales team.



Realize reliable PCB connections with Phoenix Contact

In addition to FINEPITCH series board-to-board connectors, the extensive COMBICON and CONNEXIS product portfolios also offer numerous connectors for implementing PCB connections: from preassembled connectors to connectors with 15 mm pitch for currents up to 125 A (IEC) per contact.

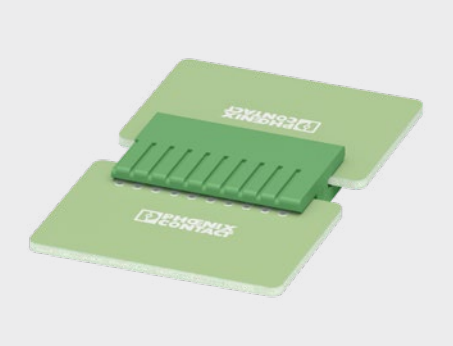
Web code: #3229



The PCB connectors for cable assemblies simplify and accelerate automated production processes. Different pitches and designs allow for various applications in robotics, elevator technology, and battery management.

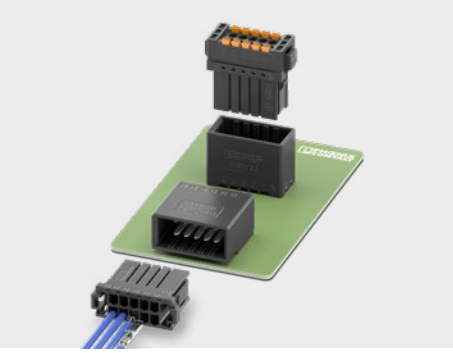
Overview of the product series

Web code: #0425



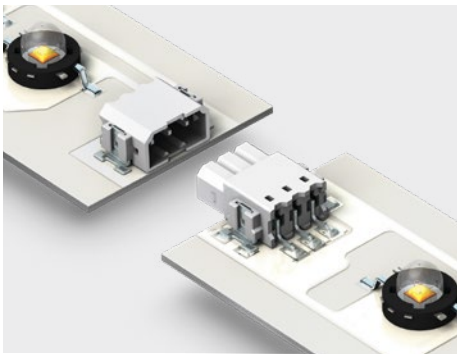
ZEC 1,0 / 1,5

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



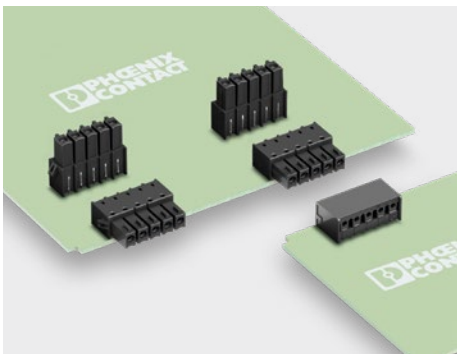
DD21 / D31 / D32

Crimp-based PCB connectors with 2.5 mm, 3.81 mm, and 5.08 mm pitch for currents up to 8 A per contact



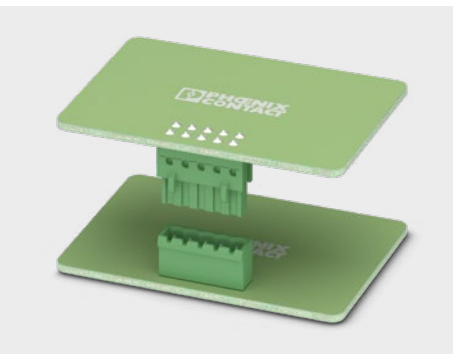
PTSM 0,5

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



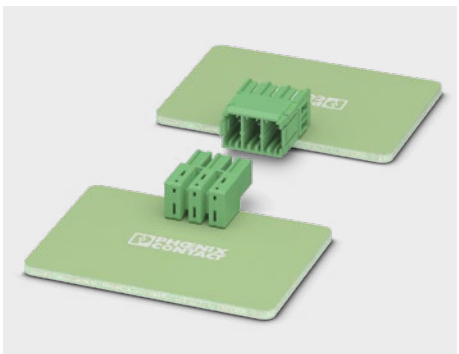
MC 1,5

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



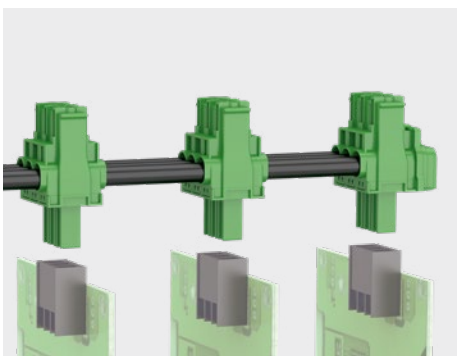
MSTB 2,5

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



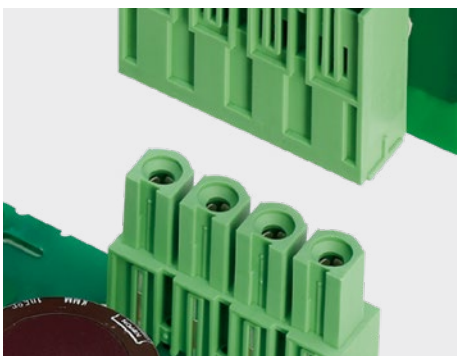
PC 5

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



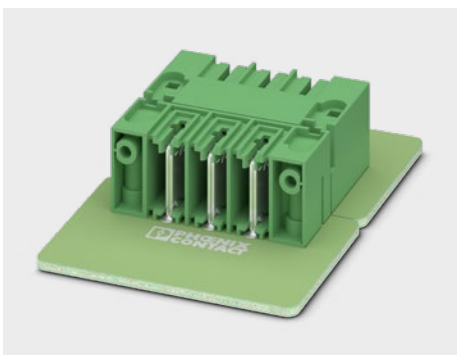
PC 6

PCB connectors for bus applications with 7.62 mm pitch for currents up to 32 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.



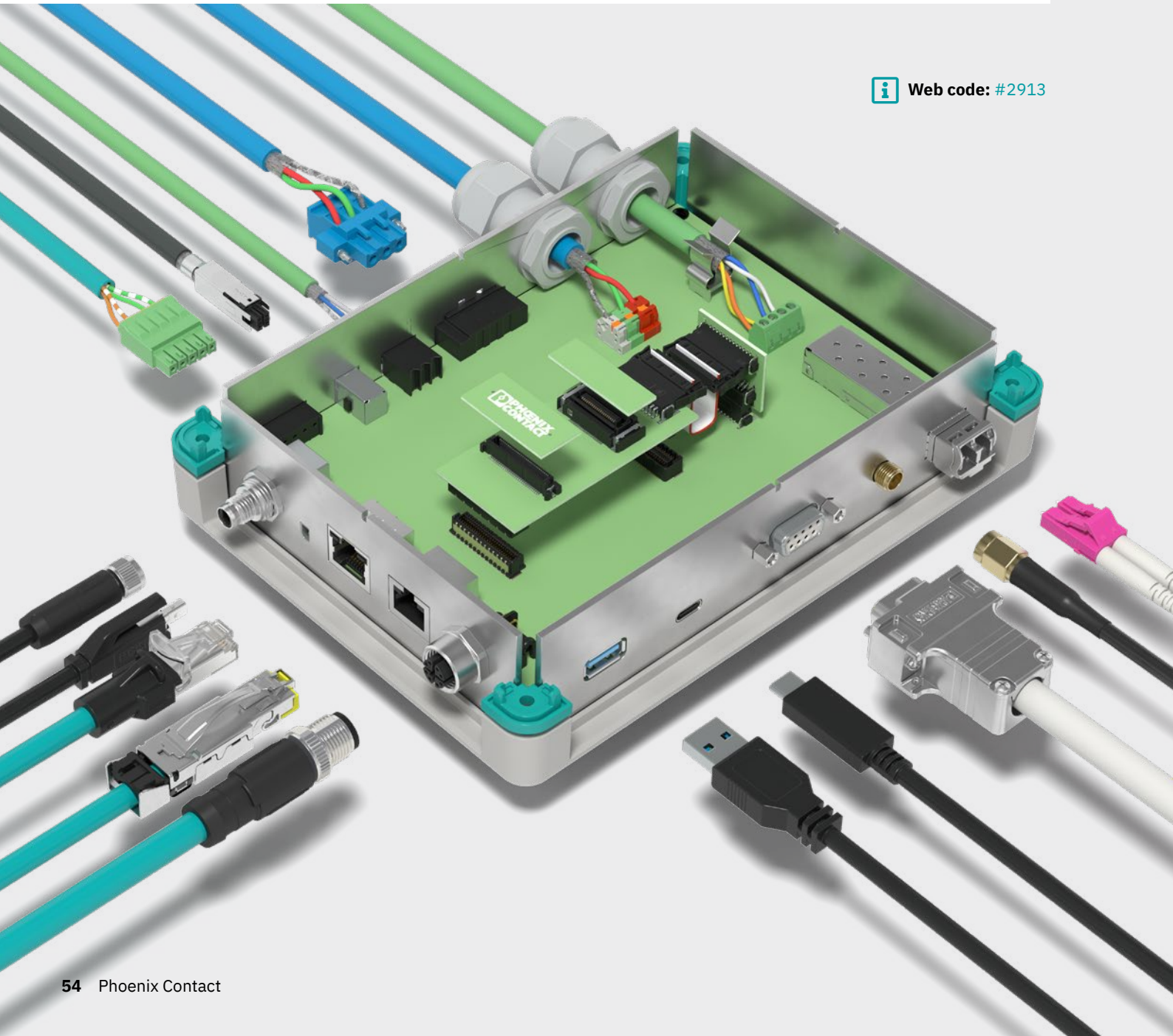
PC 35

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

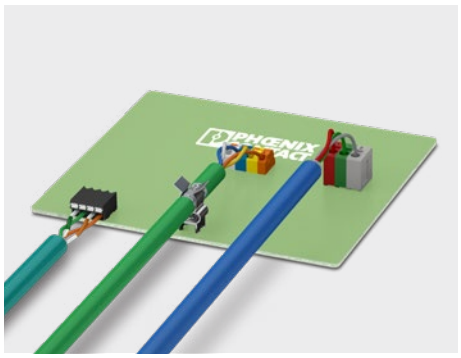
Groundbreaking data connectors for smart networks

The world is becoming increasingly networked. And that means more interfaces on devices. To handle this, Phoenix Contact provides data connectors parallel to the board-to-board connector range: from RJ45 to USB, and D-SUB through to coaxial and FO connections as well as for SPE. Splice boxes, distributors, and adapters round out the solution range. Benefit from the high product quality. All connectors from Phoenix Contact are ideal for reliable and long-lasting device communication.

Web code: #2913



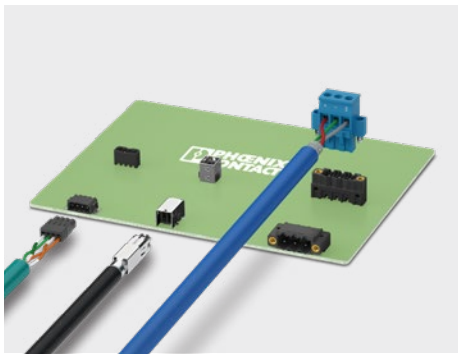
Overview of the product series



PCB terminal blocks

PCB terminal blocks for data transmission offer ideal connection solutions for your application.

Web code: #2918



PCB connectors

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

Web code: #2919



Circular connectors

Shielded circular connectors for data transmission in the sizes M8 and M12 for all common fieldbuses and networks.

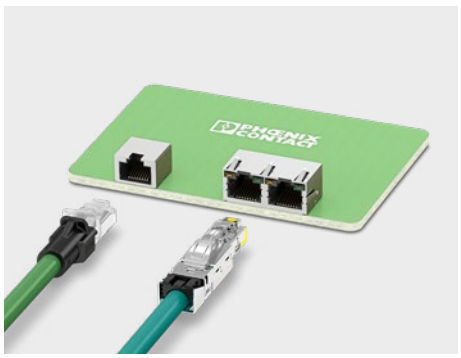
Web code: #2913



Connectors for SPE

ONEPAIR series IP20 PCB connectors and patch cables for Single Pair Ethernet.

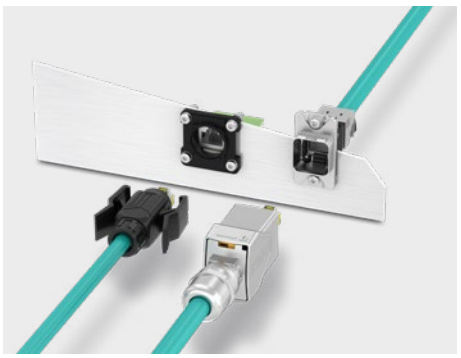
Web code: #2671



RJ45 connectors

Future-proof cabling solutions for building automation and Industrial Ethernet applications.

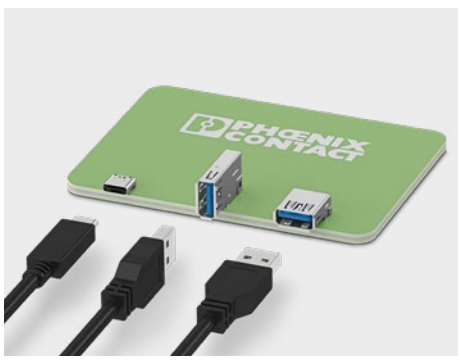
Web code: #2861



V6 and V14 connectors

Connectors of the V6 and V14 series are ideally suited for PROFINET and Ethernet cabling with the IP65/IP67 protection class.

Web code: #2922



USB connectors

Suitable as a service interface or for permanent transmission in protected industrial applications.

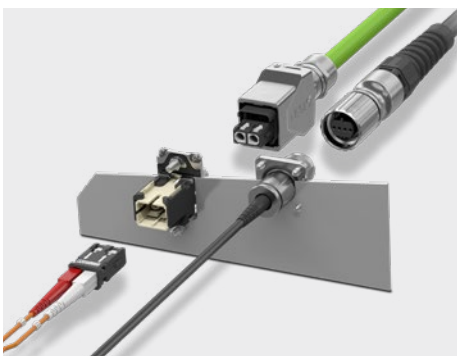
Web code: #2888



Coaxial connectors

The portfolio for coaxial cabling is ideal for the transmission of WLAN, Bluetooth, LTE, and 5G signals.

Web code: #2890



Data connectors for fiber optics

Data transmission with fiber optics based on a wide range of standardized connectors.

Web code: #2921

Design-in support during device development

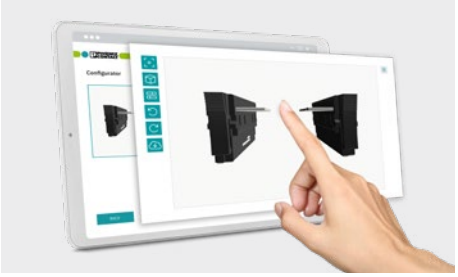
You can count on our support: We provide comprehensive technical data as well as MCAD models and ECAD data. Our PCB footprints, 3D models, and circuit diagrams provide an integrated basis for your device development. The rapidly growing demand for signal density goes hand in hand with increasingly rigorous requirements for data integrity. We will support you in optimizing signal integrity with tailored simulations and measurements.



Services at a glance



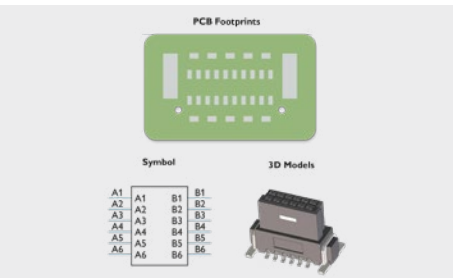
Expert support from the initial idea through to series production.



Selection and configuration of board-to-board and wire-to-board versions.



Webinars and presentations on technical subjects.



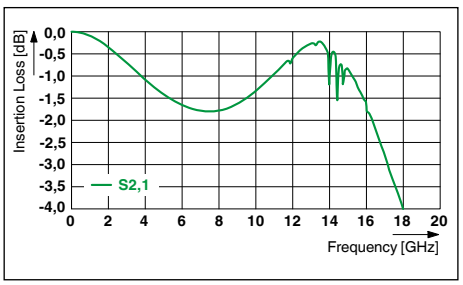
Drawings, 3D data, and footprints.



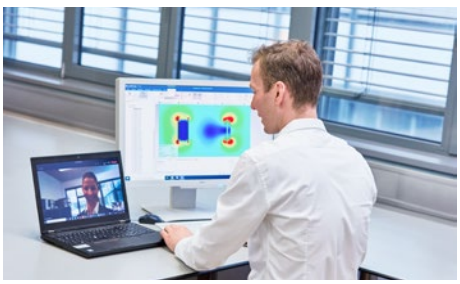
Comprehensive knowledge in technical articles and white papers.



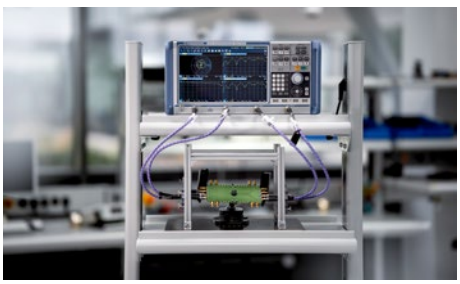
Free product samples via the online sample service.



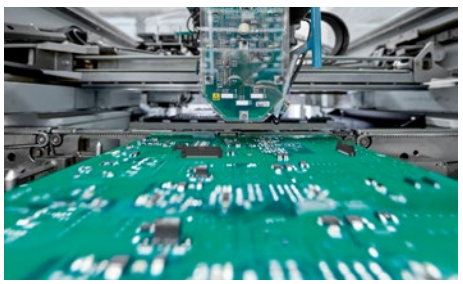
Product data sheets with information on signal integrity.



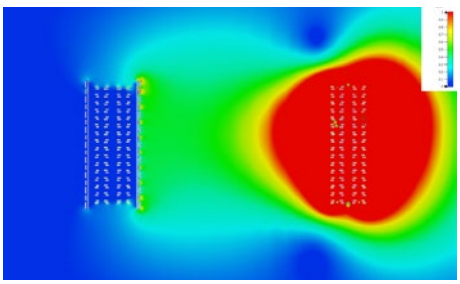
Tailored simulations in the context of the overall system.



HF measurements in a qualified laboratory.



Easy integration into the production process.



Consultation on the subject of electromagnetic compatibility (EMC).



Custom training programs – either on site or digitally.

Excellent services

Throughout your development process, Phoenix Contact will provide excellent services that make the difference. Discover how modern configurators, comprehensive technical data, and free product samples can make your daily work easier. As your partner, we will support you in the design-in process all the way to the development of customized connection and housing solutions.



Further information on Phoenix Contact services:

Simply type the web code into the search field on our website.

Web code: #2594

The easy way to more choice

Choose online from 60,000 products and find the right solution quickly:

- Intuitive filter and search functions
- Comprehensive technical data and downloads such as drawings and 3D models
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The easy way to more individuality

Customize your products with colors, printing, and special designs:

- Customer-specific versions
- Customized new product developments
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The easy way to more flexibility

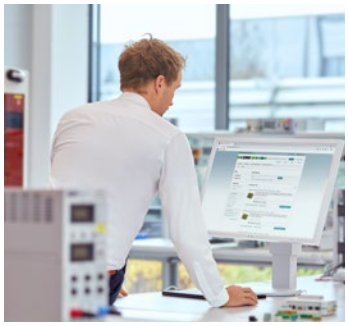
Use our different procurement channels and benefit from worldwide availability:

- All items can be ordered conveniently online
- Free sample service
- Globally reliable logistics network thanks to direct shipping or distribution

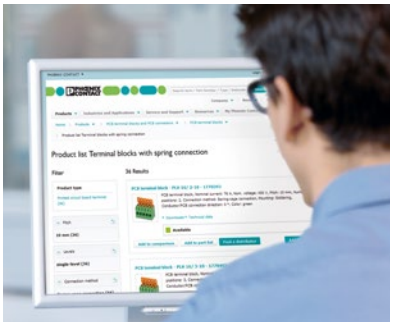
The easy way to more expertise

Always stay up to date on technologies and trends with us as your reliable partner:

- Technology, industry, and design-in experts at your side
- We will provide you with custom training programs – either on site or digitally
- Free webinars, seminars, and video tutorials



Simple selection using filters and technical data



There is a separate detail page for every product



A data sheet is available to download for every item



With our global network, Phoenix Contact is always nearby



Device connection technology can be comprehensively configured



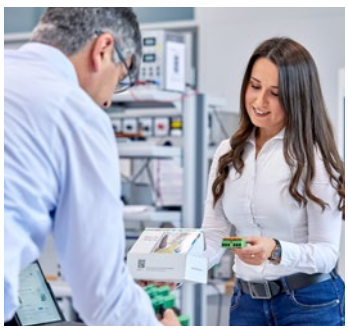
Housing parts and connection technology are easy to configure



Cable and assembly systems can be matched easily



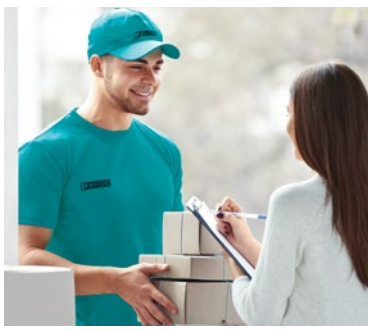
Phoenix Contact provides support from the initial idea right through to series production



Our online sample service is available in a large number of countries



Find the product you want quickly with intuitive filters



Product samples are available with free shipping



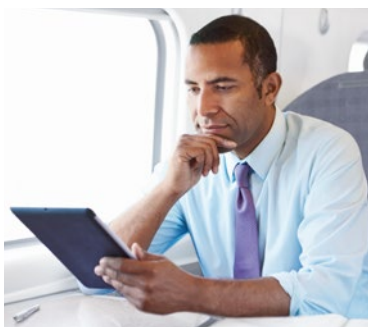
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Phoenix Contact is a global market leader based in Germany. We are known for producing forward-thinking products and solutions for the comprehensive electrification, networking, and automation of all sectors of the economy and infrastructure. With a global network, we maintain close relationships with our customers, something we believe is essential for our common success.

You can find your local partner at

phoenixcontact.com

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