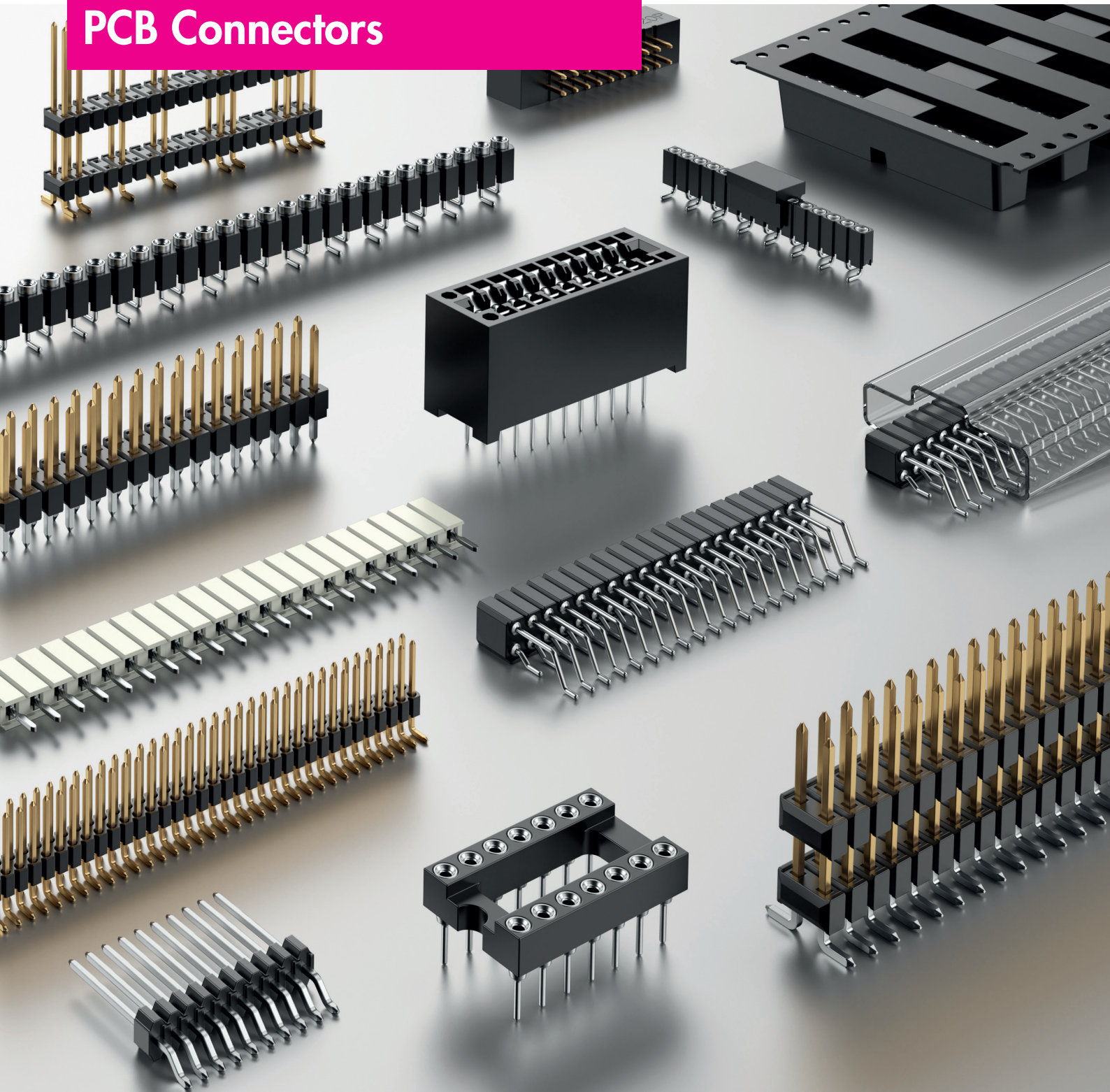
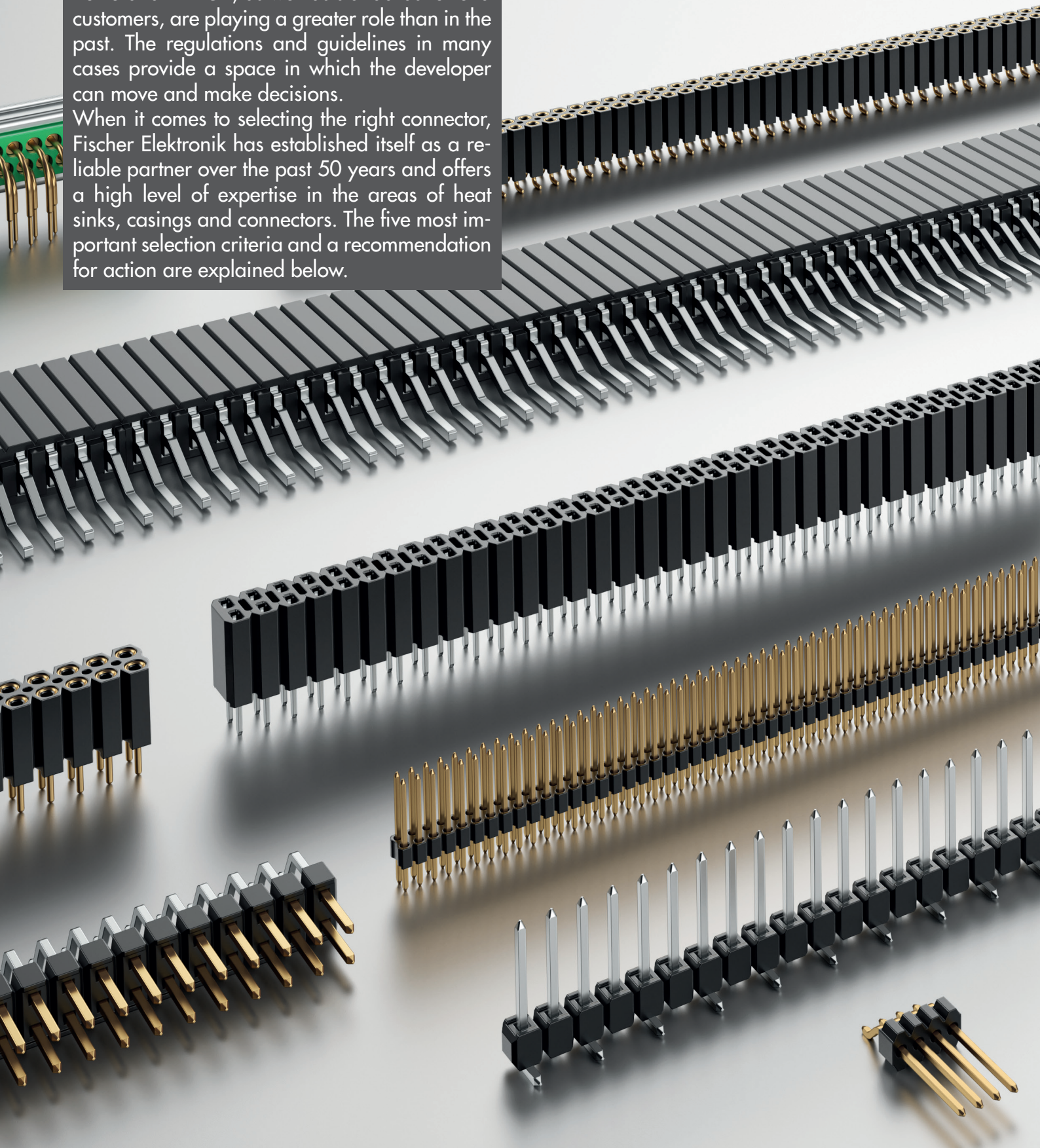


Checklist for the Selection of PCB Connectors



Selecting the right connector has become increasingly complicated in recent years. In addition to the increasing product diversity among connector manufacturers, topics such as RoHS and REACH, as well as standards for end customers, are playing a greater role than in the past. The regulations and guidelines in many cases provide a space in which the developer can move and make decisions. When it comes to selecting the right connector, Fischer Elektronik has established itself as a reliable partner over the past 50 years and offers a high level of expertise in the areas of heat sinks, casings and connectors. The five most important selection criteria and a recommendation for action are explained below.



Choosing the Right Time

For many developers and designers of circuit boards the arrangement of active components such as microcontrollers, transistors or diodes plays a decisive role. Here, passive components such as capacitors, resistors or even connectors are often placed at the back of the development process. This approach harbours great potential for conflict in the later development process. In many cases, not taking passive components into account makes the complete PCB design much more complicated and costly. As a result, it is often not possible to use standardised connectors, but instead, customised connectors have to be developed. For the manufacturer, these customised connectors often mean a modification of the production machines or the production of customised fixtures and tools. Depending on the degree of customisation, this can result in costs ranging from a few hundred to several tens of thousands of euros. For prototype quantities, however, these tool adaptations are not economical. This is why the timing for the consideration of the connectors and all other passive components is so important in order to keep the economic viability of the customer's project in reasonable limits.

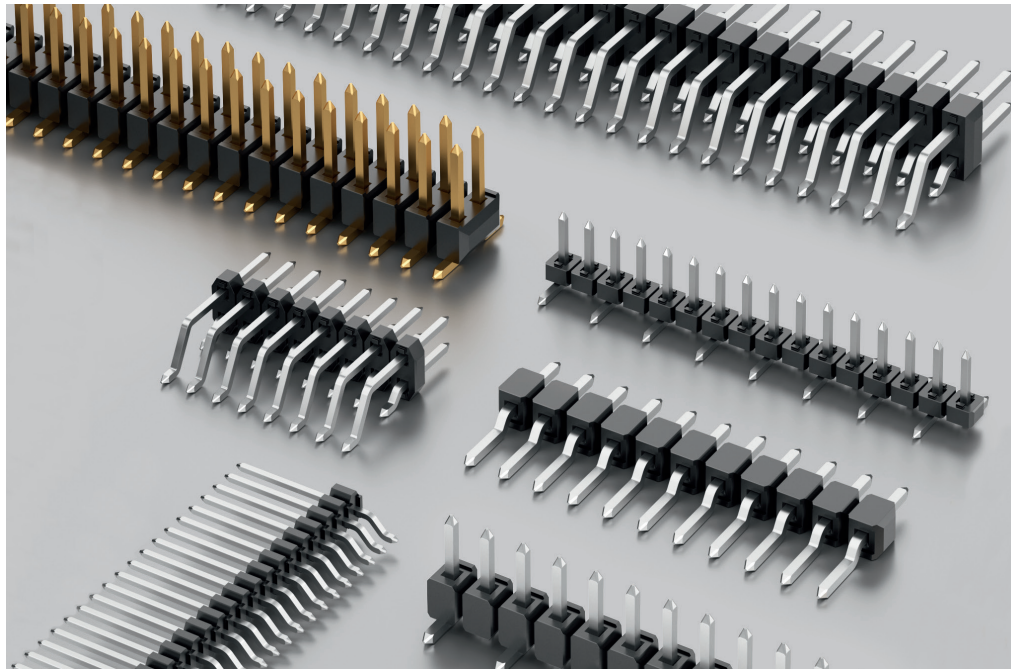


Illustration 1: Male headers

Parameter Setting

When setting parameters, it is not only a question of the number of contacts, the pitch or the contact lengths, but also the soldering method, the contact coatings or the contact and insulating body materials. In this respect, the simplest parameters are the grid dimension and the number of contacts. These are determined by the PCB layout or other electro-mechanical components. The soldering process is also often predetermined by the other electronic components on the board. Whereby a mixture of SMT and THR (Through Hole Reflow) components can also be connected to the PCB using the reflow soldering process.

However, the choice can be greater for the contact length. Depending on the contact partner, a selection of different combinations of male and female headers is possible. The contact material for the male and female contacts varies depending on the requirements of the contacts. When it comes to the mechanical, resilient properties, bronze is used rather than brass. To ensure the highest possible electrical conductivity, the copper alloy brass should be used. The most difficult decision, however, lies with the contact coatings. Depending on the requirements and area of application, many manufacturers of PCB connectors offer a choice between tin-plated and gold-plated contacts. In addition, there is also the option of using selectively gold-plated contacts in which the soldering area is tin-plated and the contact transition area is gold-plated. The advantage of this contact coating combines the positive soldering properties of tin and the high electrical conductivity of gold.

Price or Performance Oriented?

Next, the customer must decide whether his project is price or performance oriented. If it is purely a question of price, the customer should opt for THT connectors with tin-plated contacts. This combines the lowest cost soldering process with the most favourable contact coating. However, as soon as higher quantities and performance orientation are involved, the customer should

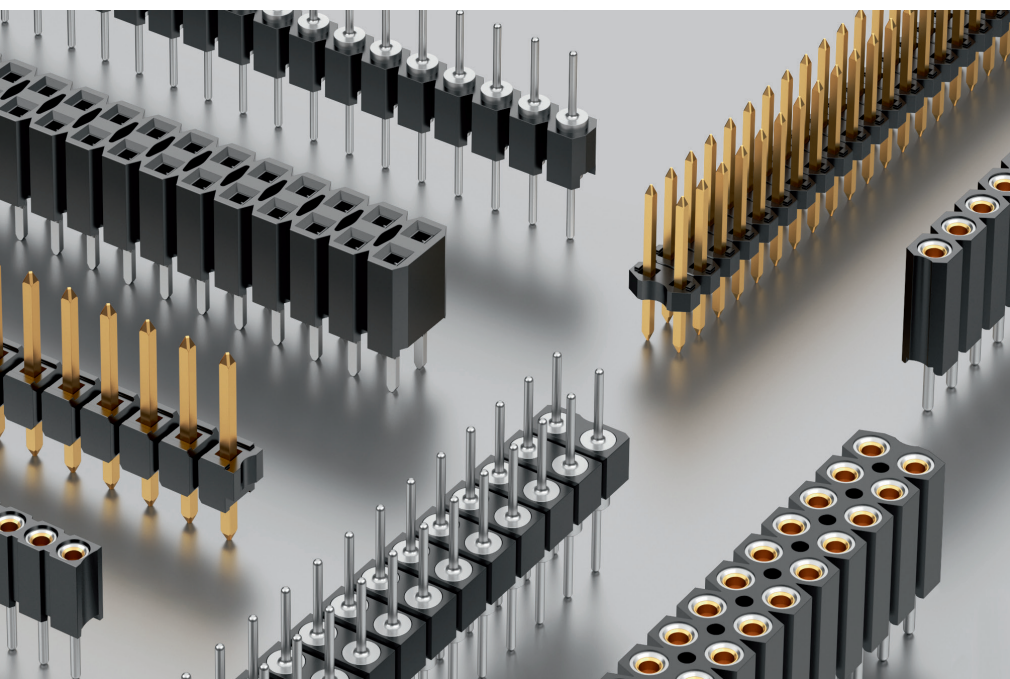


Illustration 2: THT-connectors

opt for SMD connectors with selectively gold-plated or completely gold-plated contacts. In addition, the tape & reel packaging form is recommended for the automated assembly of the selectively gold-plated SMD connectors as soon as series production is in view.

Packaging Option Selection

In addition to the standardised card-board box, which is often used for THT connectors, packaging forms can also be used for automated assembly. These packaging options are the previously

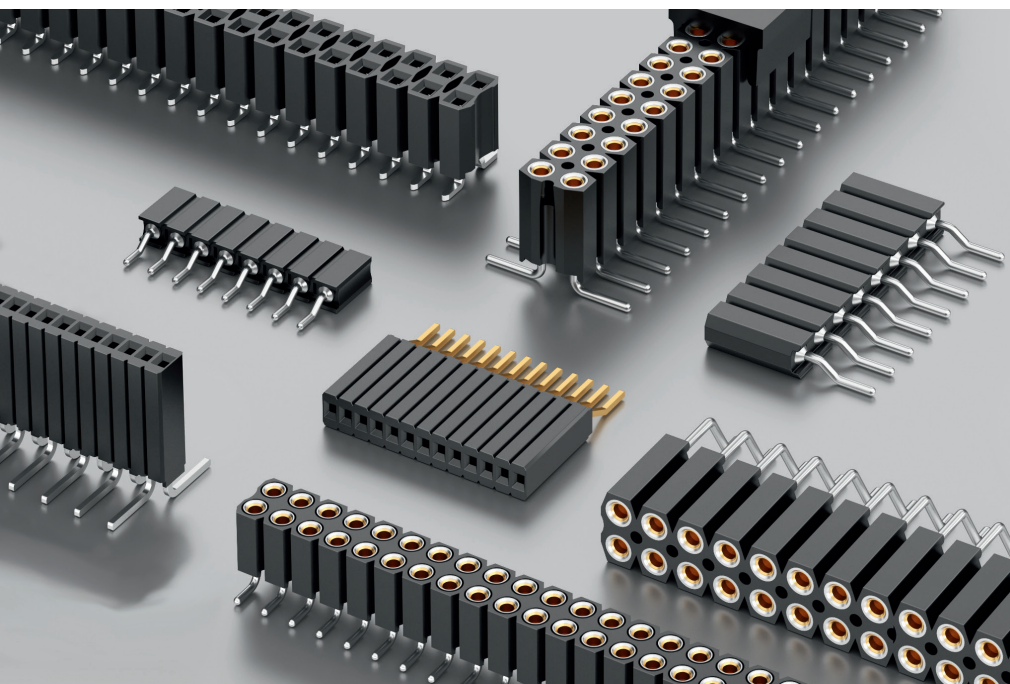


Illustration 3: Female headers

Using Germany's Location Advantage

Many manufacturers of PCB connectors are located in the Far East. The shortage of raw materials and the associated long delivery times present a great opportunity for manufacturers from Germany and Europe. Many PCB assemblers and developers are currently trying to find alternatives to connectors from the Far East by means of cross-references. This problem can be eliminated in the future by strengthening Germany as a production location and thus also the suppliers from the German and European regions. In addition to short delivery times, Fischer Elektronik also offers a high level of expertise and quality, both in standard products and in the development and production of customised special solutions.

mentioned tape & reel and the bar magazine. The bar magazine is often used in the prototype phase or for smaller production quantities. The tape & reel packaging option, on the other hand, is used more for series production and thus for higher quantities. In most cases, bar magazines are geometrically limited to a length of approx. 500 mm. Whereas with tape & reel the limitation is only determined by the height of the connector and the chamber spacing of the components in the belt. This means that significantly more connectors can be transported via the tape & reel packaging option.

Conclusion

In summary, it can be said that the customer has a great deal of design freedom when selecting the appropriate PCB connector together with the corresponding packaging option. However, the magic triangle of cost target, time target and performance target plays a decisive role. This magic triangle is currently best served by connectors from Germany and Europe. This is because, in addition to short delivery times, excellent quality and a reasonable price structure can be achieved.



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