

PCB Connector Press-Fit

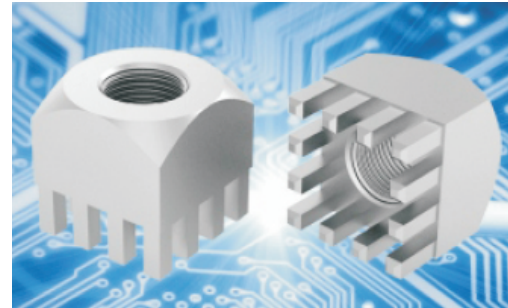
PowerOne Single-Piece Power Element

1000 A

reliable

individual design

mechanically usable/deployable



Single-piece Power Elements are used for the supply and distribution of high currents in connection with circuit board based systems. Depending on the pin arrangement and the layout, currents of up to 1,000 ampere are possible. Meanwhile this product group has been successfully used in the field in thousands of various designs. The manufacturing method allows individual adaptations regarding design and dimensions. That is the reason why Power Elements perfectly qualify as connecting element for fuses, IGBTs, switches and cables to the circuit board or as contact element for board-to-board respectively board-to-case.

Application Possibilities

- Board-to-board over 90° or packaging
- Wire-to-board screw connection of ring terminals
- Electro mechanics such as hinges and case mounting
- Spacers
- Retainers / fastenings of switches, fuses, IGBTs
- Any combination of all these and much more

Processing

In-situ² PowerOne Power Elements are pressed in into the circuit board. Soldering is not necessary. Therefore, the PCBs are not exposed to temperature stress. This processing step easily blends in to the processing chain and is highly cost efficient. With the aid of the corresponding Press Fit tools, several Power Elements can be pressed in simultaneously.

- For assembling prototypes, no special equipment is needed for pressing in, a simple toggle press is sufficient.
- The circuit board needs support during the pressing procedure.
- The pressing force must be executed in a 90° angle to the circuit board.
- After the pressing process the pins should stand out of the drilled hole (ca. 0.2 - 0.5 mm).
- Plated through holes of the circuit board must be executed according to our indications.
- PowerOne high current terminal blocks and spacers are manufactured for pressing, soldering is not intended.

Technical Data

Current carrying capacity per pin at 20 °C ~ 10 / 15 A (areal / circumferential pins)

Current carrying capacity per pin at 85 °C ~ 6 / 10 A (areal / circumferential pins)

Material CuZn39Pb3

Surfaces Tin-plated (standard)

further surfaces such as nickel, silver, nickel / gold and others on demand

Dimensions

Length x width from 5 x 5 to 22 x 22 mm

Height from 3 mm individually

Height above PCB from 3 mm individually

Pin length up to 7.5 mm (standard of 3.5 mm)

Pin diagonal 1.6 mm standard
others on demand

Circuit Board

Base material FR4 (EP-GC-)

PCB thickness from 1.5 mm

Drilling diameter 1.60 ± 0.025 mm

Final diameter 1.45 ± 0.05 mm

HAL surface

chemical surface 1.475 ± 0.05 mm

Copper in hole thickness min. 25 µm, max. 80 µm

Processing Parameters




Press-in force min. 40 N per Pin
max. 250 N per Pin

Retention force 60 - 80 % of the press-in force

Press-in speed 100 - 250 mm / min

Circuit Board Design

For the massive Press Fit Technology the PCBs are to be finished according to the In-sail⁷ ICS Press Fit specifications (see table on the side). Particular attention should be paid to the drill diameter and the copper thickness. Due to the different layer thicknesses of Hot Air Levelling compared to chemical surfaces, the final diameters vary.

Press Fit Specification		
Drill ϕ		1.6 ± 0.025 mm
Cu	 Cu - in Hole Annular Ring	min. 25 μ m, max. 80 μ m min. 125 μ m
End ϕ	 depends on surface HAL chem. surfaces	1.45 ± 0.05 mm 1.475 ± 0.05 mm

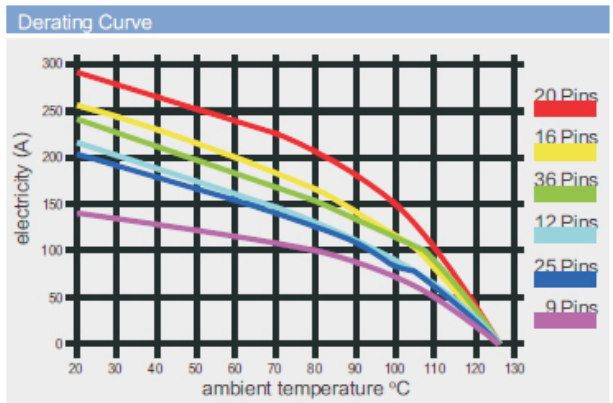
Torques

The torques indicated in the table are based on DIN 267 part 25. Different material combinations or different thread lengths of the connectors are not regarded here.

Torques for Brass								
Thread	M2.5	M3	M4	M5	M6	M8	M10	M12
(Nm)	0.3	0.5	1.2	2.2	3.9	9.0	17.0	35.0









Current Carrying Capacity

The current carrying capacity of a Press Fit connection needs to be seen in the context of the overall system. The Press Fit zone has a very low electrical contact resistance of 100 - 200 μ hm. The limiting factor therefore usually lies in the circuit board layout or in the connection of a feed line.



Reference values for a pre-dimensioning can be found under Technical Data on page 10.

Overview of PowerOne products

								
Construction Form	through hole vertical (two-rows)	blind hole vertical (two-rows)	through hole vertical (circumference)	blind hole vertical (full plain)	bolt	bracket through hole (two-rows)	bracket through hole (full plain)	U groove bracket (full plain)
Pins								
4					M3			
6					M3, ϕ 3.2			
8					M2.5, M4, M5, M6, ϕ 4.2, ϕ 5.2			
9					M3, M4, M5, ϕ 3.2			
10					M6, M8, ϕ 6.2, ϕ 8.2			
12					M4, M5, ϕ 10.2			
16					M4, M5, M6, ϕ 4.2, ϕ 5.2			
20					M8, M10			
25					M6, M8, ϕ 5.2, ϕ 6.2, ϕ 8.2			
36					M10, M12, ϕ 8.2, ϕ 10.2			

All threads are also available in UNC

Supplies

Based on your different requirements, we also provide some relevant products at the back of this brochure. For further inquiries, please contact our sales Representative.