PowerTwo
Two-Piece Power Elements

Original
POWER ELEMENT
Intelligent Systems

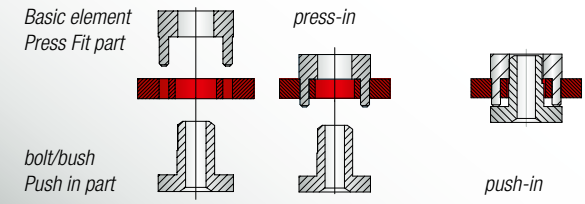
Two-piece Power Elements are a Würth Elektronik patented solution for through screw technologies on circuit boards. These high current terminal blocks and spacers enable a durable and reliable connection and mounting on the PCB without stressing it.
Depending on the pin arrangement and the layout, currents of up to 500 ampere are possible. The assembly method allows individual adaptions regarding design and dimensions. That is the reason why Power Elements perfectly qualify as connecting elements for fuses, IGBTs, switches and cables and the circuit board or for board-to-board connections.

Application Possibilities

- Board-to-board stackable
- Wire-to-board screw connection of ring terminals
- Electro mechanics, through screw technology, spacers
- Retainers / fastenings of switches, fuses, IGBTs
- Any combination of all these and much more

Processing

Würth Elektronik PowerTwo 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 Press Fit 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

Technical Data

Current carrying capacity per pin at 20 °C	~ 15 A
Current carrying capacity per pin at 85 °C	~ 10 A
Material	CuZn39Pb3
Surfaces	tin-plated (standard)
	further surfaces such as nickel, silver, nickel / gold and others on demand

Dimensions

Length x width	from 9 x 9 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	HAL surface	1.45 +/- 0.05 mm
	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

Compliant

COMPLIANT RoHS&REACh WÜRTH ELEKTRONIK

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Circuit Board Design

For the massive Press Fit Technology the PCBs are to be finished according to the Würth Elektronik 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.

Würth Elektronik ICS – Press Fit Specification 5.1

Drill Ø			1.6 +/- 0.025 mm
Cu	Cu-H	**Cu** – in **H**ole **A**nnular Ring	min. 25 µm, max. 80 µm min. 125 µm
End Ø	A	**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

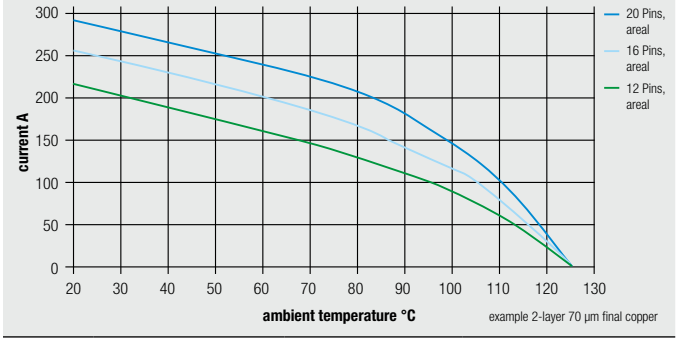
Thread	M 2.5	M 3	M 4	M 5	M 6	M 8	M 10
(Nm)	0.3	0.5	1.2	2.2	3.9	9.0	17.0

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 µOhm. 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 1.

Derating Curve



Overview of Standard Products

						
available products		**188**	**96**	**60**	**35**	**192**
construction form		**basic element pins circumferential**	**basic element pins two-rowed**	**bush through hole vertical**	**bolt**	**customer specific**
■	**Pins**					
9	**4, 8, 12**			M 3 - M 4 · Ø 3.1 - Ø 4.2		
10	**4, 8, 12**			M 3 - M 4 · Ø 3.1 - Ø 4.2		
12	**8, 16**			M 4 - M 5 · Ø 4.1 - Ø 5.3		
13	**10, 16**			M 5 - M 6 · Ø 4.1 - Ø 6.4		
16	**12, 16, 20, 24**			M 6 - M 8 · Ø 6.1 - Ø 8.5		
18	**20, 25, 28, 40, 42**			M 6 - M 8 · Ø 6.1 - Ø 8.5		
20	**24, 32**			M 8 - M 10 · Ø 8.1 - Ø 10.5		
22	**28, 32, 56**			M 8 - M 10 · Ø 2.6 - Ø 10.5		

All threads are also available in UNC.

Supplies

Press Fit tools and die plates are available on demand.

For more information visit us at:
www.we-online.com/pe
or call our Hotline: **+49 7940 9810-4444**