

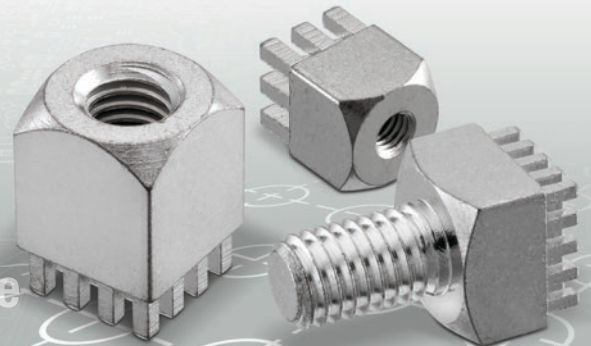


# PowerOne

## Single-Piece Power Elements

**Original**  
**POWER ELEMENT**  
 Intelligent Systems

**1000 A** configurable  
 reliable established  
 mechanically usable / deployable  
 individual design  
 individual dimensions



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. PowerOne high current terminal blocks and spacers were developed by Würth Elektronik in 1987. 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

Würth Elektronik 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	1.6 +/- 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



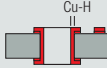
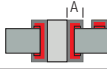
# PowerOne

## Single-Piece Power Elements



### 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	
<b>Drill Ø</b>	1.6 +/- 0.025 mm
<b>Cu</b>	 <b>Cu - in Hole Annular Ring</b> min. 25 µm, max. 80 µm min. 125 µm
<b>End Ø</b>	 <b>depends on surface</b> <b>HAL</b> 1.45 +/- 0.05 mm <b>chem. surfaces</b> 1.475 +/- 0.05 mm

### Torques

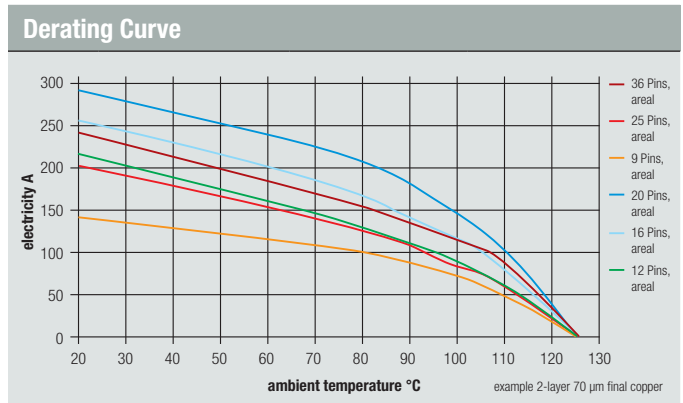
The torques indicated in the table are based on DIN 267 part 25. Different material combinations or different thread lengths of the connectors are not regarded here.

Torques for Brass								
Thread	M 2.5	M 3	M 4	M 5	M 6	M 8	M 10	M 12
(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 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.



### Overview of Standard Products

						
<b>available products</b>	138	85	22	93	32	2176
<b>construction form</b>	bush blind hole vertical	bush through hole vertical	bush through hole horizontal	bolt	bracket through hole horizontal	customer specific
<b>■ Pins</b>						
5	4, 6, 9		M 2.5 - M 3 · Ø 2.6 - Ø 3.4			
7	4, 6, 9		M 2.5 - M 5 · Ø 2.6 - Ø 5.5			
9	4, 8, 12, 16		M 3 - M 6 · Ø 3.2 - Ø 6.6			
10	4, 8, 12, 16		M 3 - M 6 · Ø 3.2 - Ø 6.6			
12	4, 10, 16, 25		M 4 - M 6 · Ø 4.2 - Ø 6.6			
13	4, 10, 16, 25		M 4 - M 8 · Ø 4.2 - Ø 9.0			
16	12, 20, 36		M 5 - M 10 · Ø 5.2 - Ø 10.5			
18	14, 24, 40, 49		M 5 - M 10 · Ø 5.2 - Ø 10.5			
20	16, 28, 48, 64		M 5 - M 10 · Ø 5.2 - Ø 10.5			
22	18, 32, 56, 81		M 5 - M 10 · Ø 5.2 - Ø 10.5			

All threads are also available in UNC.

### Supplies

Under the product category PowerCover, we offer a large choice of twist and contact protection elements. Press Fit tools and die plates for the prototype assembling with small Press Fit systems and also for serial production with automats, are available on demand.

For more information visit us at:  
[www.we-online.com/pe](http://www.we-online.com/pe)  
 or call our Hotline: +49 7941 9205-4444