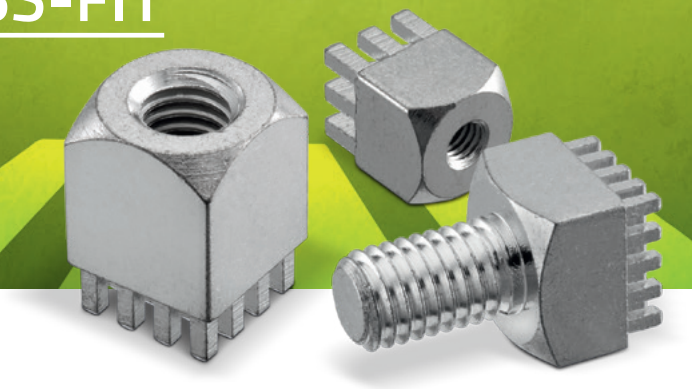
LF POWERONE PRESS-FIT

Powerelements



LF PowerOne Press-Fit Powerelements are one-piece lead-free high current contacts in solid design which are used for the supply and distribution of high currents to PCBs. They are flexible, configurable, and easily usable in thousands of various designs. Depending on the pin arrangement and the layout, currents of up to 1000 amperes are possible. This makes these power supply terminals ideal for use as connection elements for fuses, for cable connections to the PCB, or as fastening elements.

The LF Powerelements from Würth Elektronik ICS are lead-free high current contacts with the same performance and application range as the original Powerelements. However, they already now meet the future requirements of the RoHS Directive without any exemptions.

Applications

- Contacting / mounting of switches, fuses, etc.
- Wire-to-board screw connection of the cable lugs
- Board-to-board
- Electromechanics such as mounting of housings and space

Processing

LF PowerOne Press-fit Powerelements are pressed into the PCB. Soldering is not required, so there is no temperature stress. The manufacturing step easily fits into the process and is highly cost effective. With the aid of the corresponding tools, several Powerelements can be pressed-in simultaneously.

Processing information

- For assembling prototypes, no special equipment is required for pressing-in, as a simple toggle press is sufficient.
- The PCB must be supported during the press-fit process.
- The press force has to be applied at a 90° angle to the PCB.
- Plated through holes of the PCB must be executed according to the specifications of Würth Elektronik ICS.
- The LF PowerOne Press-fit high current contacts are designed for pressing-in, and a soldering process is not intended.
- Use only with suitable press-fit tool and fixing materials (see processing instructions).

Technical data	
Current carrying capacity	see table on the back
Material	brass lead-free (max. 0.1% Pb)
Surfaces	tin-plated (standard)
	further surfaces such as nickel, silver, nickel/gold and others on demand

Dimensions (standard)	
Length x width	from 7 x 7 mm
Height above PCB	from 3 mm
Pin length	3.5 mm, others on demand
Pin diagonal	1.6 mm, others on demand

PCB	
Base material	FR4 (EP-GC-)
PCB thickness	from 1.5 mm

Processing parameters	
Press-in force	min. 60 N per pin max. 250 N per pin
Retention force	60 – 80 % of the press-in force
Press-in speed	100 – 250 mm/min

With comprehensive engineering expertise and as a pioneer for Powerelements, we will meet your requirements and find the best technical and economical solution - whether from our standard range or as a customised variant.

LEAD-FREE REACH COMPLIANT RoHS COMPLIANT

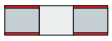
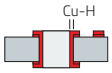
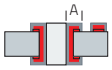
PCB design
The PCB has to be designed in accordance with the latest edition of IPC A 600.
For solid press-fit technology, the PCBs are to be finished according to the Würth Elektronik ICS Press-fit specifications. Particular attention should be paid to the drill diameter and the copper thickness.

Torques
Torque values for the various thread dimensions can be found in the table opposite. Different material combinations or different thread lengths of the connectors are not listed here. Depending on the thread length, the bushes can be tightened with higher torques.

Current carrying capacity
The current carrying capacity of a press-fit connection always has to be considered in the context of the overall system. The press-fit zone has a very low electrical contact resistance of 100 – 200 µΩ.
The limiting factor therefore usually lies in the PCB layout, and also in the connection of a feed line.
Depending on the system structure, the values of the derating curve shown may vary.

Qualification
LF PowerOne Press-fit high current contacts have successfully passed the vibration test and the mechanical shock test according to ISO 16750-3 standard.
Vibration test according to ISO 16750-3:2012 4.1.2.7 Random Test VII.
Mechanical shock test according to ISO 16750-3:2012 4.2.3 Severity 2.

Würth Elektronik ICS – Press-fit specification 5.1 (Example for 1.6 mm pin)

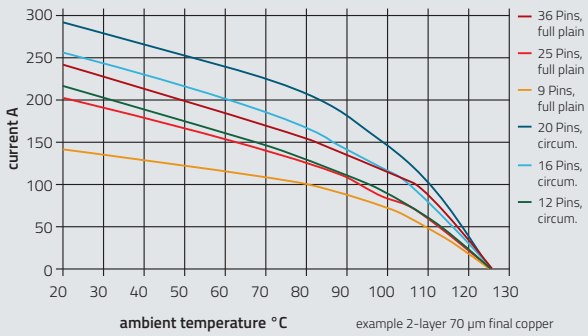
Drill Ø		drill tool drill hole	1.60 mm 1.60 - 0.025 mm
Cu		**Cu** - in **H**ole **A**nnular Ring	Average 30 – 60 µm min. 25 µm, max. 80 µm* min. 125 µm
End Ø		**depends on surface** **HAL** **chem. surfaces**	 (1.45 +/- 0.05 mm) (1.475 +/- 0.05 mm)
Note: For press-fit technology, drill Ø and copper thickness are fix. End Ø for reference only.			

*single measurement points in microsection

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

Derating curve LF PowerOne Press-fit



example 2-layer 70 µm final copper

Overview LF PowerOne Press-fit standard products

Construction form	 bush vertical, blind hole	 bush vertical, through hole	 bush horizontal, through hole	 bush angled	 bolt
Pins	**Current carrying capacity at 20°C* / 85°C***			**Dimensions**	
4, 6, 9	~ 60 – 135 A / ~ 36 – 81 A			for M2.5 – M3 with Ø 2.6 – Ø 3.4	
4, 6, 9	~ 60 – 135 A / ~ 36 – 81 A			for M2.5 – M5 with Ø 2.6 – Ø 5.5	
4, 8, 12, 16	~ 60 – 240 A / ~ 36 – 144 A			for M3 – M6 with Ø 3.2 – Ø 6.6	
4, 10, 16, 25	~ 60 – 375 A / ~ 36 – 225 A			for M4 – M6 with Ø 4.2 – Ø 6.6	
4, 10, 16, 25	~ 60 – 375 A / ~ 36 – 225 A			for M4 – M8 with Ø 4.2 – Ø 9.0	
12, 20, 36	~ 180 – 540 A / ~ 108 – 324 A			for M5 – M10 with Ø 5.2 – Ø 10.5	
14, 24, 40, 49	~ 210 – 735 A / ~ 126 – 441 A			for M5 – M10 with Ø 5.2 – Ø 10.5	
16, 28, 48, 64	~ 240 – 960 A / ~ 144 – 576 A			for M5 – M10 with Ø 5.2 – Ø 10.5	
18, 32, 56, 81	~ 270 – 1215 A / ~ 162 – 729 A			for M5 – M10 with Ø 5.2 – Ø 10.5	

* Recommended value for system design based on PCB limiting temperature of 125°C

All threads are also available in UNC.

Supplies
In the PowerCover product category, we offer a large choice of twist and contact protection elements. Press-fit tools and plates are available on demand.

For more information visit us at:
www.powerelement.com
or call: **+49 7940 9810-4444**

Würth Elektronik ICS GmbH & Co. KG
Intelligent Power & Control Systems
Gewerbepark Waldzimmern · Würthstraße 1
74676 Niedernhall · Germany
+49 7940 9810-0 · Fax +49 7940 9810-1099
ics@we-online.com · www.we-online.com/ics