

# PowerElements

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Connectors



# PowerElements - CONNECTORS

As stated in its name, PowerElements can be used essentially anywhere where you are dealing with “power” sourcing capabilities, namely high current on the Printed Circuit Board (PCB).

Be it “Wire-to-Board” sourcing and distribution in PCB based high current applications, or assembly, component connection and fixation such as screw locking (e.g. midi or mega fuses), relays with screw connection, conductor rail etc. on the PCBs.

To achieve this we also provide additional insulation bodies e.g. twist protection, to help avoid shorts and contact on the cable side of the connections such as cable lugs.

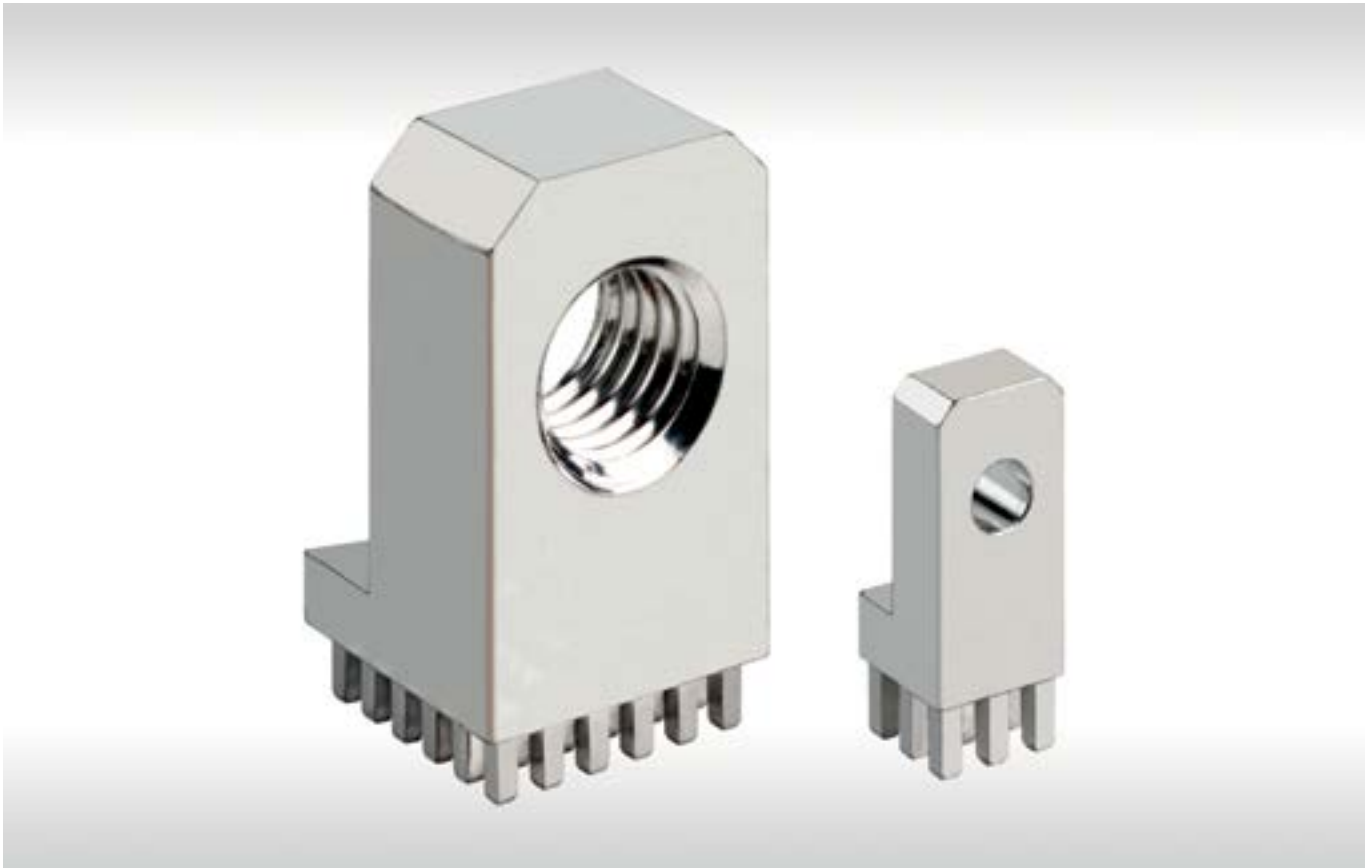
Also mechanical challenges, such as the PCB connection inside a housing, in the interior or even with a second PCB can be realised using PowerElements.

The two piece PowerElement offers a special feature – it is press fitted from both sides of the PCB. The bearing surface on either side helps provide protection to the PCB against mechanical stress during assembly in the installation space.

Virtually, there are no limits to the variety of PowerElements connection options.

Whether it is the headless screw, the thread nut as well as through holes or blind holes, whether perpendicular or angled, even the installation height, connection surface and thread or drill dimension can be selected and combined with essentially no restriction.

PowerElements in press-fit technology and Surface-Mounted Device (SMD) solder technology are available for processing. SMD PowerElements are delivered blister packed for fully automated assembly.



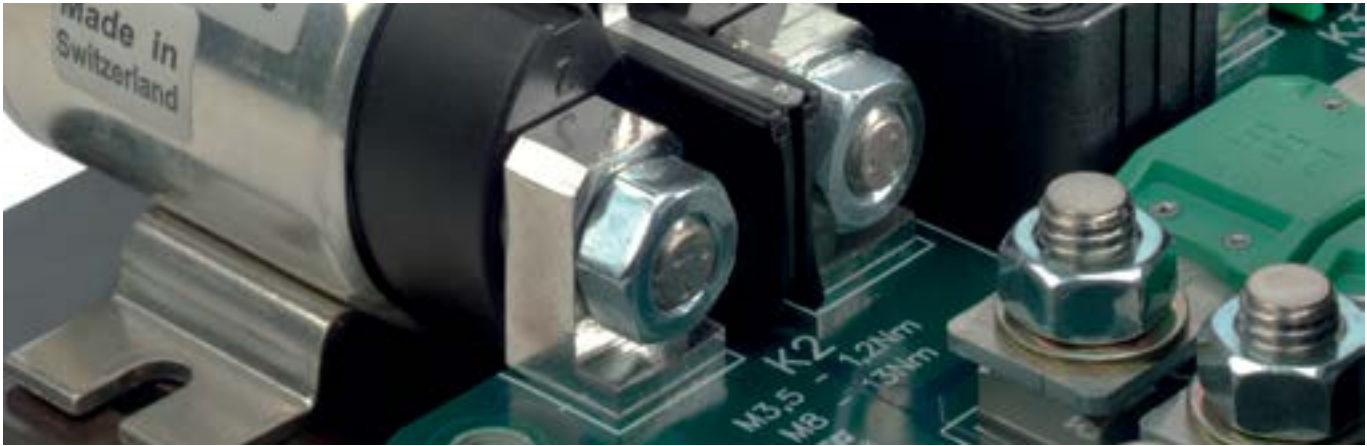
## APPLICATION EXAMPLES



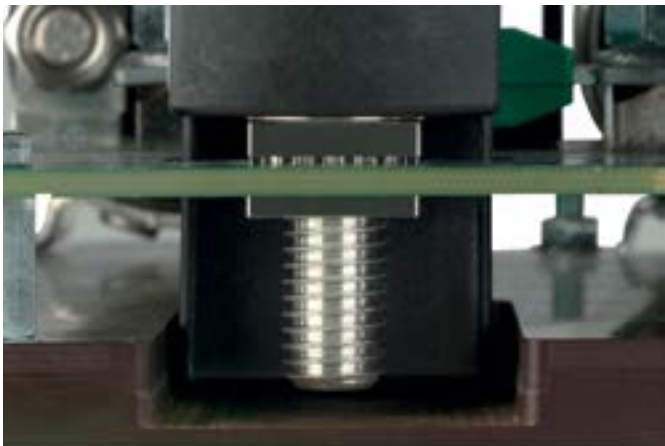
Attaching a cable to a M8 male thread PowerElement with twist protection



Attaching a megafuse on two M8 male thread PowerElements



Attaching a high-current relay onto an angled PowerElement



Attaching a battery disconnecting switch on two piece PowerElements



Attaching a midifuse onto two M5 male thread PowerElements

# FITTING INSTRUCTIONS

The BLUEcontact PowerElements are REACH conform and with a lead content under 4 percentage by weight, they are also RoHS conform.

The PowerElements can be press fitted from a PCB thickness of 1.6 mm upwards. Immersion tin and HAL lead free are the most preferable PCB surfaces here.

PowerElements for SMD solder technology should not be stored for longer than 24 months, as the solderability cannot be provided for.

- retention force according to IEC 60352-5
- press fit force: max. 250 N per pin
- temperature range: -40°C to + 135°C

# TECHNICAL DATA

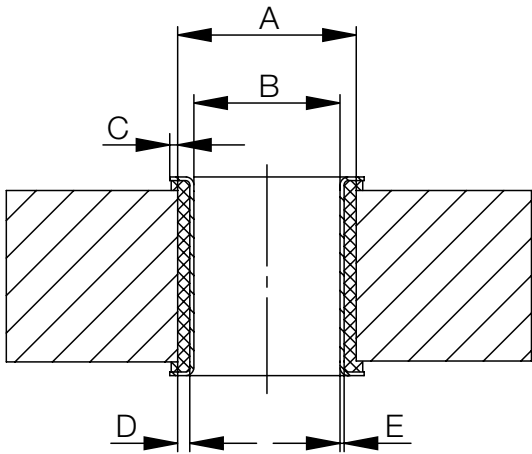
|                    |                                         |
|--------------------|-----------------------------------------|
| Material base body | CuZn39Pb3                               |
| Surface            | tin plated                              |
| Retention force    | according to IEC 352-5                  |
| Press fit force    | max. 250 N per pin<br>min. 40 N per pin |
| Press out force    | min. 30 N per pin                       |
| PCB thickness      | min. 1.6 mm                             |

# CHARACTERISTICS PowerElements WITH MASSIVE PRESSFIT ZONE

## General Technical Data

|                                              |                      |
|----------------------------------------------|----------------------|
| Current carrying capability per PowerElement | approx. 10 A per pin |
| Tightening torque:                           | M3: 0.5 Nm           |
|                                              | M4: 1.2 Nm           |
|                                              | M5: 2.2 Nm           |
|                                              | M6: 3.9 Nm           |
|                                              | M8: 9.0 Nm           |
|                                              | M10: 17.0 Nm         |
|                                              | M12: 35.0 Nm         |
| Operating temperature                        | -40°C to +135°C      |

## Drill Hole Specifications



|                       | Surface       | A           | B             | C        | D                              | E             |
|-----------------------|---------------|-------------|---------------|----------|--------------------------------|---------------|
| Massive pressfit zone | Immersion tin | ø 1.6 -0.03 | ø 1.475 ±0.05 | 0.1 min. | Cu 25 µm min.<br>Cu 60 µm max. | Sn 15 µm max. |
|                       | HAL lead free | ø 1.6 -0.03 | ø 1.45 ±0.05  | 0.1 min. | Cu 25 µm min.<br>Cu 60 µm max. | Sn 15 µm max. |

CAUTION:

It is essential that both the drill diameter and final diameter are complied with in order to obtain the specified characteristics.

# CHARACTERISTICS PowerElements WITH SMD SOLDER TECHNOLOGY

## Product Groups

The PowerElements for SMD-Solder technology are usually categorised into three main groups

- SMD pin (with or without peg)
- SMD socket (with or without peg)
- SMD socket with through-hole thread

SMD PowerElements only available on request



## General Technical Data

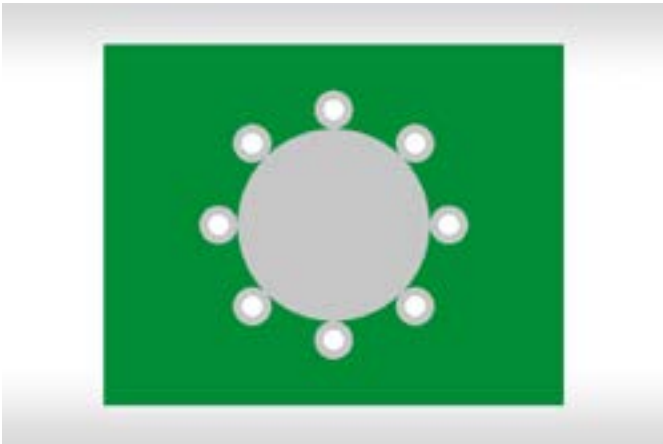
|                                              |                                                                                    |
|----------------------------------------------|------------------------------------------------------------------------------------|
| Current carrying capability per PowerElement | up to 200 A*                                                                       |
| Tightening torque                            | M3: 0.5 Nm<br>M4: 1.2 Nm<br>M5: 2.2 Nm<br>M6: 3.9 Nm<br>M8: 9.0 Nm<br>M10: 17.0 Nm |
| Operating temperature                        | -40°C to +155°C                                                                    |
| Solder paste thickness                       | 150 µm                                                                             |

\* current carrying capability is subject to PCB thickness, cable cross section, the soldering tin used as well as ambient temperature

## Layout Specifications

The SMD PowerElements have a round base body that is rotationally symmetrical. The diameter of the SMD Pad should be at least 0.5 mm larger than the diameter of the base body of the selected PowerElement. In the case of elements with a spigot, an additional non-plated through hole with a drilled diameter of 1.2 mm must be placed in the center. In the case of elements with a through hole, additional non-plated through holes must also be placed, depending on the diameter of the base body:

- PowerElement with diameter 7 mm: NPT hole with 5.2 mm
- PowerElement with diameter 9 mm: NPT hole with 6.2 mm
- PowerElement with diameter 13 mm: NPT hole with 9.2 mm
- PowerElement with diameter 16 mm: NPT hole with 12.2 mm



If you have detailed questions about the layout or recommended soldering paste, please contact the ERNI team directly.

# OVERVIEW

## Product Matrix Pressfit Technology

|  | Number of pins                                | 6                                    | 8          | 9      | 10     | 12     | 16         | 20 | 25     | 36  | 49 |
|--|-----------------------------------------------|--------------------------------------|------------|--------|--------|--------|------------|----|--------|-----|----|
|  | Male thread, full pin population              |                                      |            | M3, M5 |        |        | M4, M5     |    | M6, M8 |     |    |
|  | Female thread, full pin population            |                                      |            | M3     |        |        | M4, M5, M6 |    | M8     | M10 |    |
|  | Female thread, two rows pin population        | M3                                   | M4, M5, M6 |        |        |        |            |    |        |     |    |
|  | Female thread, circular pin population        |                                      |            |        |        | M4, M5 | M6         |    |        |     |    |
|  | Angled, full pin population                   |                                      |            | M3     |        |        | M4, M5     |    | M6, M8 |     |    |
|  | Angled, two rows pin population               | M3                                   | M4, M5     |        | M6, M8 |        |            |    |        |     |    |
|  | Protection for PowerElements with male thread | Suitable for M3, M4, M5, M6, M8, M10 |            |        |        |        |            |    |        |     |    |

## Product Matrix SMD-Solder Technology

|  | Diameter                            | 7  | 9      | 10 | 13     |
|--|-------------------------------------|----|--------|----|--------|
|  | SMD pin                             | M3 | M4, M5 |    | M6, M8 |
|  | SMD pin with spigot                 | M3 | M4, M5 |    | M6, M8 |
|  | SMD socket                          | M3 | M4, M5 |    | M6, M8 |
|  | SMD socket with spigot              | M3 | M4, M5 | M6 | M8     |
|  | SMD socket with through-hole thread | M3 | M4, M5 |    | M6     |



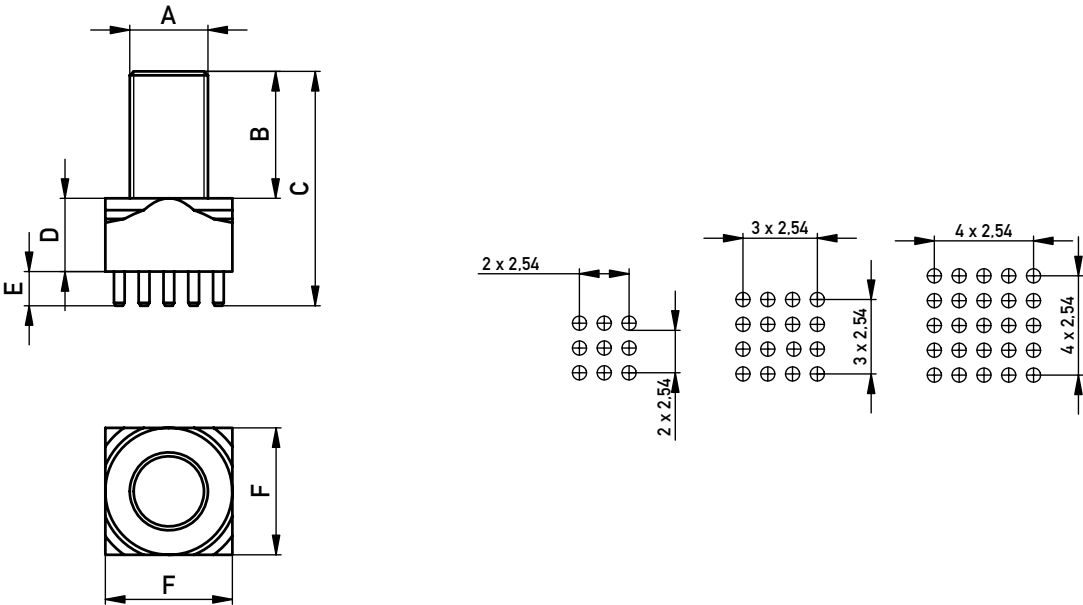
# MASSIVE PRESSFIT ZONE, MALE THREAD AND FULL PIN POPULATION

## Product Specification

- PCB connection for fixing cable lugs
- fixing midi or mega fuses on the PCB
- UNC thread or customer specific modifications on demand



## Dimensional Drawings



## Ordering Information

| A  | B  | C    | D   | E   | F  | No. of Pins | Weight | Part Number |
|----|----|------|-----|-----|----|-------------|--------|-------------|
| M3 | 5  | 11   | 3   | 3.5 | 7  | 9           | 2.1    | 225675      |
| M4 | 6  | 13   | 3.5 | 3.5 | 9  | 16          | 3.6    | 225676      |
| M4 | 6  | 12.5 | 3   | 3.5 | 7  | 9           | 3.6    | 225804      |
| M5 | 8  | 15.5 | 4   | 3.5 | 7  | 9           | 4.3    | 225777      |
| M5 | 8  | 16   | 4.5 | 3.5 | 9  | 16          | 4.9    | 225677      |
| M6 | 10 | 19   | 5.5 | 3.5 | 13 | 25          | 10.5   | 225678      |
| M8 | 13 | 24   | 7.5 | 3.5 | 13 | 25          | 15.9   | 225679      |

Dimension B - F in mm, Weight in g

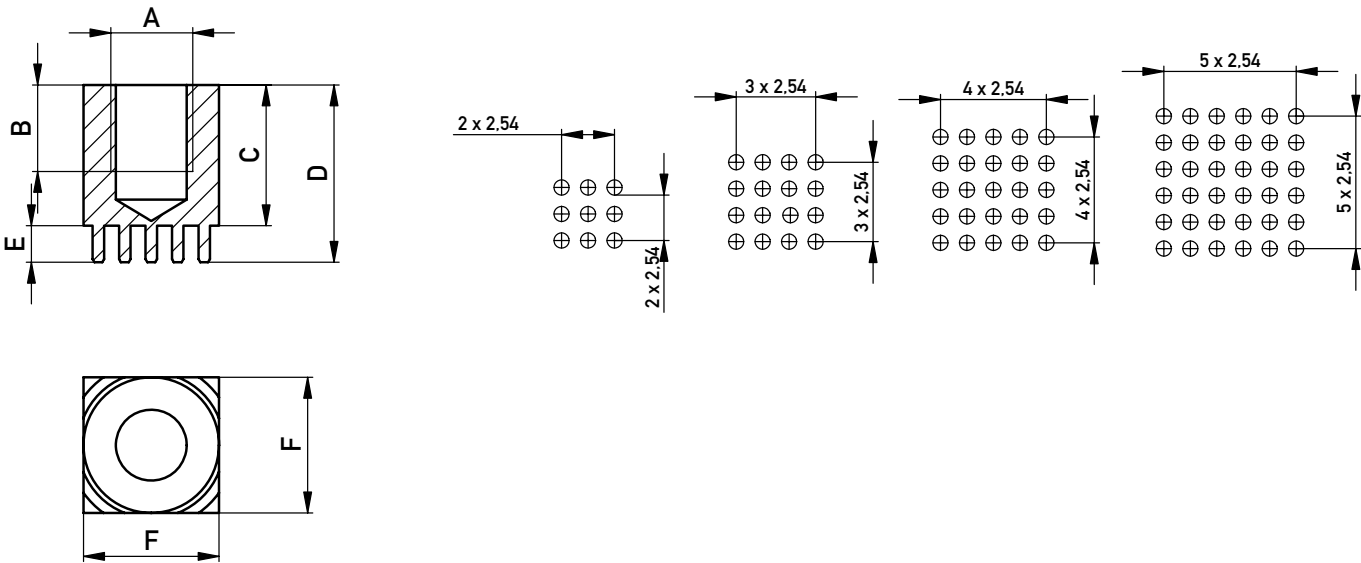
# FEMALE THREAD AND FULL PIN POPULATION

## Product Specification

- PCB connection for fixing cable lugs
- fixing midi or mega fuses on the PCB
- UNC thread or customer specific modifications on demand



## Dimensional Drawings



## Ordering Information

| A   | B   | C    | D    | E   | F  | No. of Pins | Weight | Part Number |
|-----|-----|------|------|-----|----|-------------|--------|-------------|
| M3  | 3.5 | 6    | 9.5  | 3.5 | 7  | 9           | 2.5    | 225681      |
| M4  | 4   | 7    | 10.5 | 3.5 | 9  | 16          | 4.6    | 225682      |
| M5  | 4   | 7    | 10.5 | 3.5 | 9  | 16          | 4.4    | 225683      |
| M6  | 6.5 | 10.5 | 14   | 3.5 | 10 | 16          | 7      | 225684      |
| M8  | 8   | 13.5 | 17   | 3.5 | 13 | 25          | 14.2   | 225685      |
| M10 | 11  | 17.5 | 21   | 3.5 | 16 | 36          | 26.2   | 225686      |

Dimension B - F in mm, Weight in g

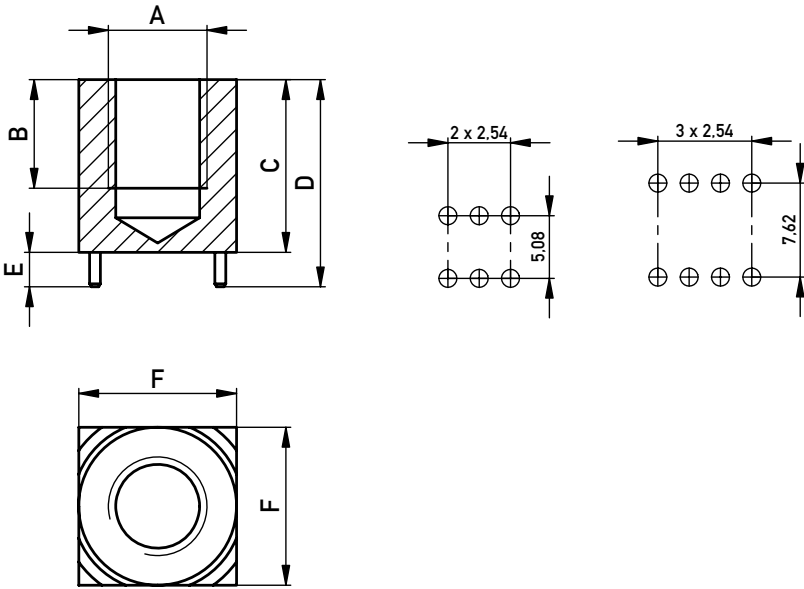
# FEMALE THREAD AND TWO ROWS PIN POPULATION

## Product Specification

- PCB connection for fixing cable lugs
- available with continuous thread
- fixing midi or mega fuses on the PCB
- when smaller pressfit forces are required
- when the layout does not permit full pin population
- UNC thread or customer specific modifications on demand



## Dimensional Drawings



## Ordering Information

| A  | B | C    | D    | E   | F  | No. of Pins | Weight | Part Number |
|----|---|------|------|-----|----|-------------|--------|-------------|
| M3 | 5 | 6    | 9.5  | 3.5 | 7  | 6           | 2.3    | 225693      |
| M4 | 6 | 7    | 10.5 | 3.5 | 9  | 8           | 4.2    | 225694      |
| M5 | 6 | 7    | 10.5 | 3.5 | 9  | 8           | 3.8    | 225695      |
| M6 | 9 | 13.5 | 17   | 3.5 | 10 | 8           | 8.2    | 225696      |

Dimension B - F in mm, Weight in g

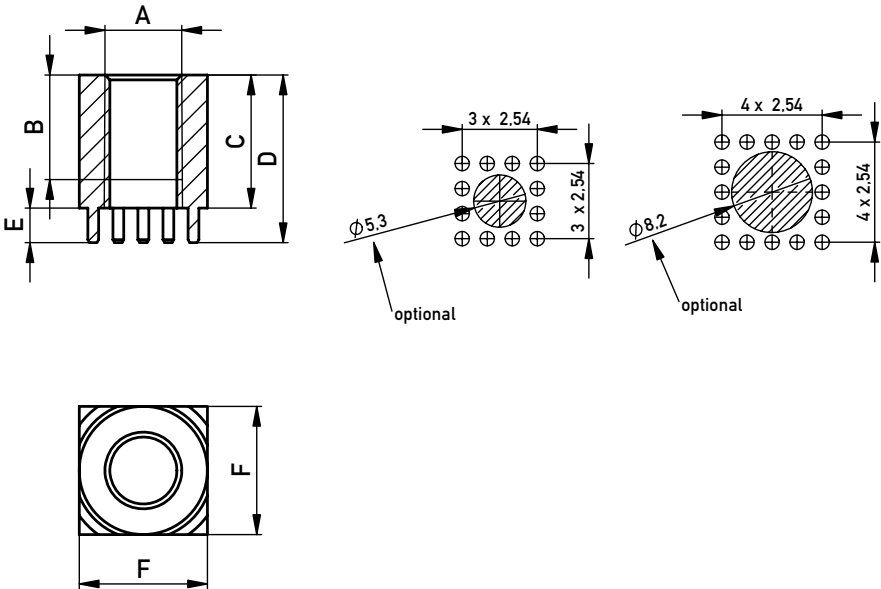
# FEMALE THREAD AND CIRCULAR PIN POPULATION

## Product Specification

- PCB connection for fixing cable lugs
- available with continuous thread
- fixing midi or mega fuses on the PCB
- when smaller pressfit forces are required
- when the layout does not permit full pin population
- UNC thread or customer specific modifications on demand



## Dimensional Drawings



## Ordering Information

| A  | B   | C    | D   | E   | F  | No. of Pins | Weight | Part Number |
|----|-----|------|-----|-----|----|-------------|--------|-------------|
| M4 | 5.2 | 6    | 9.5 | 3.5 | 9  | 12          | 3.8    | 225688      |
| M5 | -   | 6    | 9.5 | 3.5 | 9  | 12          | 3.6    | 225689      |
| M6 | -   | 13.5 | 17  | 3.5 | 13 | 16          | 14.6   | 225690      |

Dimension B - F in mm, Weight in g

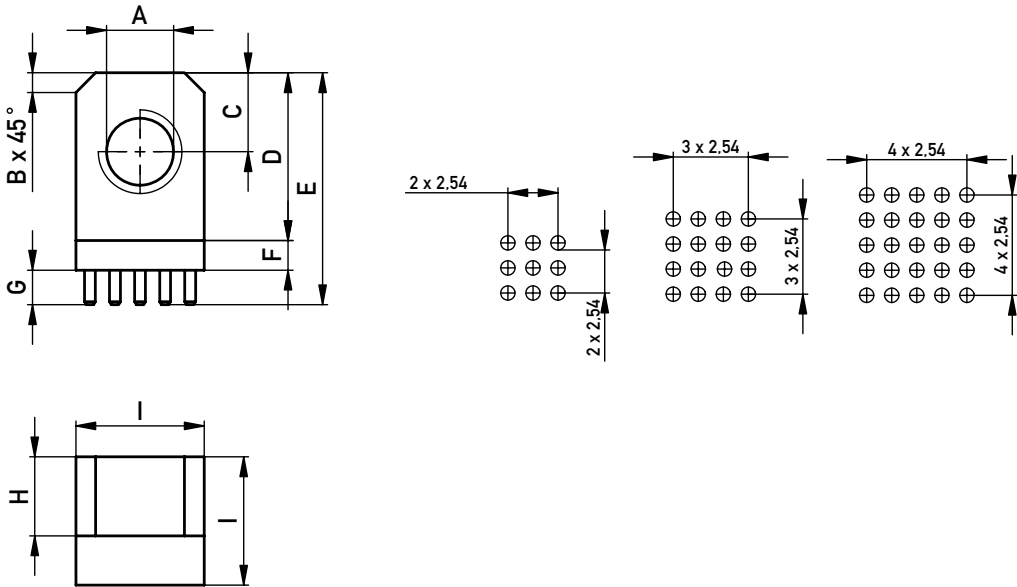
# ANGLED, FULL PIN POPULATION

## Product Specification

- PCB connection for fixing cable lugs
- connection 90°
- available with thread or through hole
- UNC thread or customer specific modifications on demand
- as a fixing element for assembly onto housing etc.
- e.g. for the connection of high current relays



## Dimensional Drawings



## Ordering Information

| A  | B   | C | D  | E    | F | G   | H | I  | No. of Pins | Weight | Part Number |
|----|-----|---|----|------|---|-----|---|----|-------------|--------|-------------|
| M3 | 1   | 5 | 11 | 17.5 | 3 | 3.5 | 4 | 7  | 9           | 4.2    | 225699      |
| M4 | 1.5 | 5 | 11 | 17.5 | 3 | 3.5 | 5 | 9  | 16          | 6.6    | 225700      |
| M5 | 1.5 | 5 | 11 | 17.5 | 3 | 3.5 | 5 | 9  | 16          | 6.4    | 225701      |
| M6 | 2   | 8 | 17 | 23.5 | 3 | 3.5 | 8 | 13 | 25          | 19     | 225702      |
| M8 | 2   | 8 | 17 | 23.5 | 3 | 3.5 | 8 | 13 | 25          | 17.7   | 225703      |

Dimension B - I in mm, Weight in g

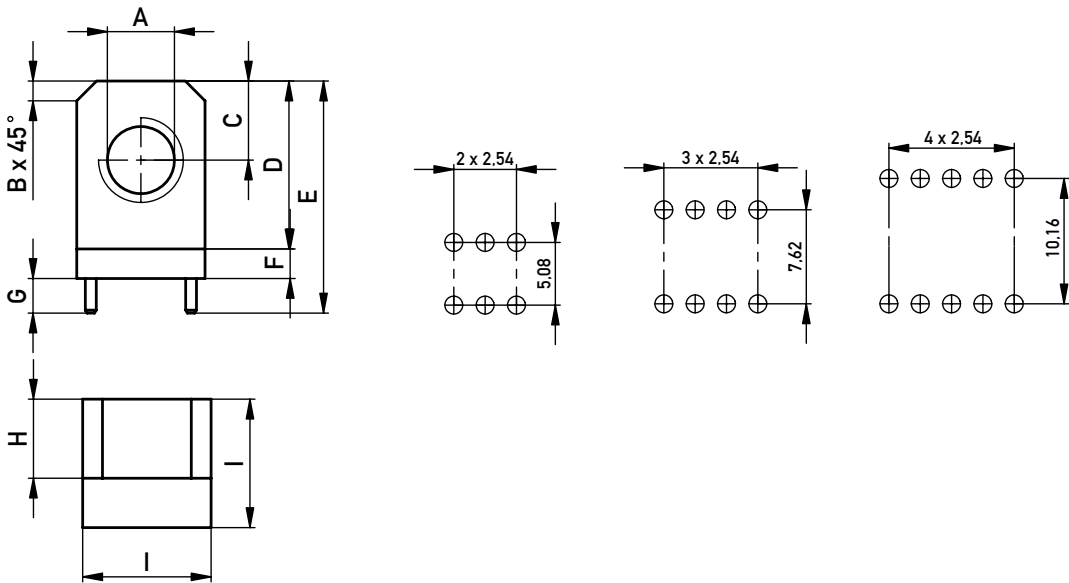
# ANGLED, TWO ROW PIN POPULATION

## Product Specification

- PCB connection for fixing cable lugs
- connection 90°
- available with thread or through hole
- UNC thread or customer specific modifications on demand
- when smaller pressfit forces are required
- when the layout does not permit full pin population
- e.g. for the connection of high current relays



## Dimensional Drawings



## Ordering Information

| A  | B   | C | D  | E    | F | G   | H | I  | No. of Pins | Weight | Part Number |
|----|-----|---|----|------|---|-----|---|----|-------------|--------|-------------|
| M3 | 1   | 5 | 11 | 17.5 | 3 | 3.5 | 4 | 7  | 6           | 4      | 225711      |
| M4 | 1.5 | 5 | 11 | 17.5 | 3 | 3.5 | 5 | 9  | 8           | 6.3    | 225712      |
| M5 | 1.5 | 5 | 11 | 17.5 | 3 | 3.5 | 5 | 9  | 8           | 6.1    | 225713      |
| M6 | 2   | 8 | 17 | 23.5 | 3 | 3.5 | 8 | 13 | 10          | 18.4   | 225714      |
| M8 | 2   | 8 | 17 | 23.5 | 3 | 3.5 | 8 | 13 | 10          | 17.2   | 225715      |

Dimension B - I in mm, Weight in g

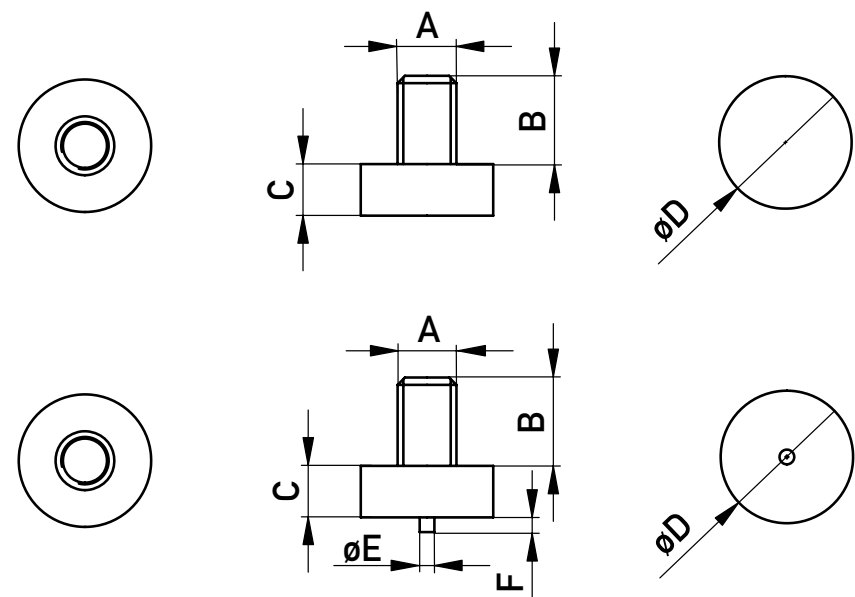
# SMD, MALE THREAD

## Product Specification

- for soldering in SMT
- available with and without peg
- blistered for fully automated assembly
- PCB connection for fixing cable lugs
- UNC thread or customer specific modifications on demand
- only available on request



## Dimensional Drawings



## Ordering Information

| A  | B  | C   | D  | E | F | Mounting Peg |
|----|----|-----|----|---|---|--------------|
| M3 | 5  | 3   | 7  | - | - | 0            |
| M4 | 6  | 3.5 | 9  | - | - | 0            |
| M5 | 8  | 4.5 | 9  | - | - | 0            |
| M6 | 10 | 5.5 | 13 | - | - | 0            |
| M8 | 13 | 7.5 | 13 | - | - | 0            |
| M3 | 5  | 3   | 7  | 1 | 1 | 1            |
| M4 | 6  | 3.5 | 9  | 1 | 1 | 1            |
| M5 | 8  | 4.5 | 9  | 1 | 1 | 1            |
| M6 | 10 | 5.5 | 13 | 1 | 1 | 1            |
| M8 | 13 | 7.5 | 13 | 1 | 1 | 1            |

Dimension B - F in mm

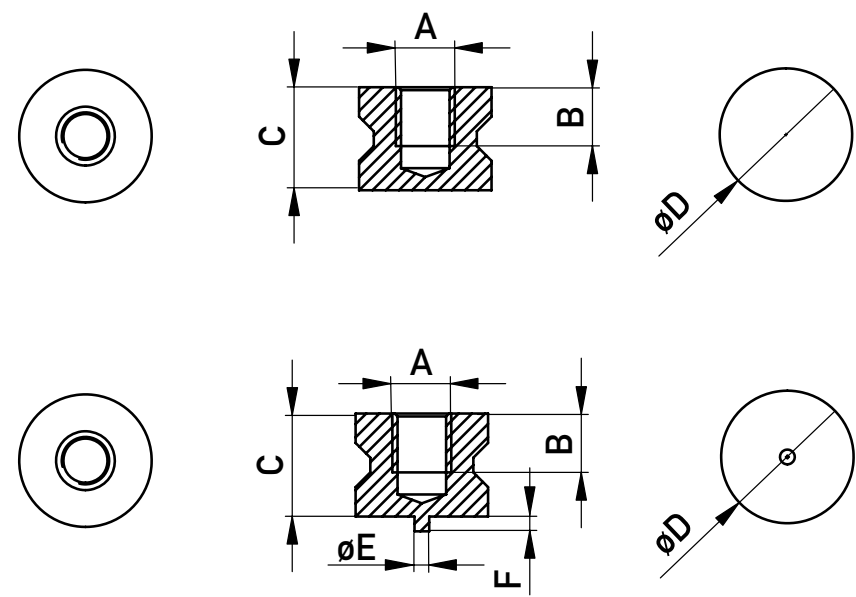
# SMD, FEMALE THREAD

## Product Specification

- for soldering in SMT
- available with and without peg
- partially blistered for fully automated assembly
- PCB connection for fixing cable lugs
- UNC thread or customer specific modifications on demand
- only available on request



## Dimensional Drawings



## Ordering Information

| A  | B   | C    | D  | E | F | Mounting Peg |
|----|-----|------|----|---|---|--------------|
| M3 | 3.5 | 6    | 7  | - | - | 0            |
| M4 | 4   | 7    | 9  | - | - | 0            |
| M5 | 4   | 7    | 9  | - | - | 0            |
| M6 | 6.5 | 11.5 | 13 | - | - | 0            |
| M8 | 8   | 13.5 | 13 | - | - | 0            |
| M3 | 3.5 | 6    | 7  | 1 | 1 | 1            |
| M4 | 4   | 7    | 9  | 1 | 1 | 1            |
| M5 | 4   | 7    | 9  | 1 | 1 | 1            |
| M6 | 6.5 | 11.5 | 13 | 1 | 1 | 1            |
| M8 | 8   | 13.5 | 13 | 1 | 1 | 1            |

Dimension B - F in mm



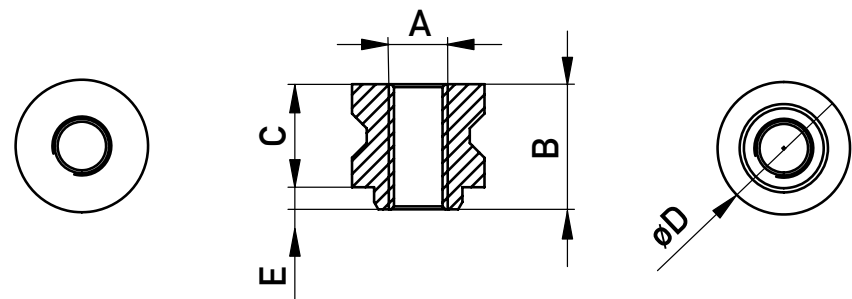
# SMD, FEMALE THREAD THROUGHOUT

## Product Specification

- for soldering in SMT
- available with and without peg
- blistered for fully automated assembly
- PCB connection for fixing cable lugs
- UNC thread or customer specific modifications on demand
- only available on request



## Dimensional Drawings



## Ordering Information

| A  | B   | C    | D  | E   |
|----|-----|------|----|-----|
| M3 | 7.5 | 6    | 7  | 1.5 |
| M4 | 8.5 | 7    | 9  | 1.5 |
| M5 | 8.5 | 7    | 9  | 1.5 |
| M6 | 13  | 11.5 | 13 | 1.5 |

Dimension B - E in mm

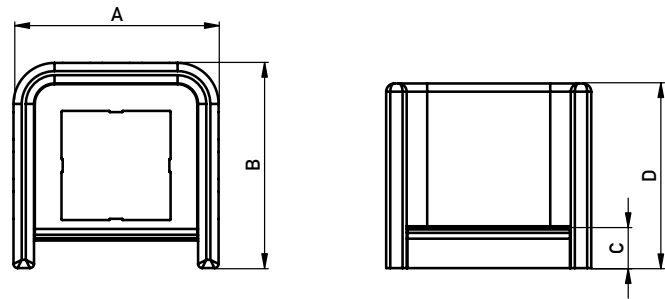
# TWISTED AND CONTACT PROTECTION FOR MALE POWER ELEMENTS

## Product Specification

- for placement particularly on the PowerElement pins
- to help prevent short circuits to nearby components
- as protection against contact
- smaller distances between two power elements in layout is feasible



## Dimensional Drawings



## Ordering Information

| A  | B  | C   | D    | Part Number |
|----|----|-----|------|-------------|
| 16 | 16 | 2   | 9.5  | 225794      |
| 18 | 18 | 2.5 | 14.5 | 225795      |
| 25 | 25 | 5   | 22.5 | 225796      |

Dimension A - D in mm

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