PRESS-FIT ZONES
What is press-fit technology?

Press-fit technology is the insertion of component connection pins (especially from connectors or single contacts) into the metallized holes of a printed circuit board (PCB). The contact between the press-fit pin and the wall of the hole is gas-tight and characterized by good conductivity. The prerequisite for this is that the press-fit pin has a larger diagonal than the hole diameter on the PCB. The spring-force behavior of the press-fit pin and the printed circuit board creates a positive connection.

Advantages of press-fit technology compared to soldering:

- No soldering errors, no flux problems
- No need for additional washing
- No thermal loads on the PCB or electronic components
- Quick and cost-efficient PCB assembly
- Double-sided PCB assembly possible
- Recycling simply by pressing out the pins

Innovations for the automotive industry

For applications in the automotive industry we manufacture press-fit zones with material thicknesses of 0.4 mm, 0.6 mm, 0.8 mm and 1.2 mm. Depending on the requirements regarding ambient temperature and electrical conductivity, either standard surfaces or our special surfaces for press-fit zones may be used.

Our flexible press-fit zone types EPZ EE and EPZ EloPin can be used in PCBs with metallized holes according to DIN EN 60352-5 and according to customer specifications. Prior to serial production, we can manufacture the press-fit zone in near-series quality in our in-house prototyping department, allowing us to take the specific requirements of our customers into account at this early stage.
**TYPICAL VALUES**

**Component**
- Material (Standard): CuSn6, CuNiSi alloys
- Material thickness: 0.4 mm, 0.6 mm, 0.8 mm, 1.0 mm and 1.2 mm
- Press-fit zone plating: Sn/SnPb, Advanced Indium or Advanced AgSn over Ni

**PCB**
- Material: FR4, FR4 with Tg > 150 °C
- Thickness: 1.6 mm (Standard)
- PCB type: Double and multi layer
- Sleeve design: Specified for press-fit technology

<table>
<thead>
<tr>
<th>Press-fit contact EE (embossed form)</th>
<th>Press-fit contact EloPin (needle eye)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>L1</strong></td>
<td><strong>ElPin06</strong></td>
</tr>
<tr>
<td>&gt; 2.5 mm</td>
<td>≥ 3.6 mm</td>
</tr>
<tr>
<td><strong>L2</strong></td>
<td>&gt; 0.5 mm</td>
</tr>
<tr>
<td>≥ 0.45 mm</td>
<td>&gt; 1.2 mm</td>
</tr>
<tr>
<td><strong>X</strong></td>
<td>≥ 1.8</td>
</tr>
<tr>
<td>(Width of press-fit zone)</td>
<td>(Width of press-fit zone)</td>
</tr>
<tr>
<td>Ø (0.6 mm)</td>
<td>Ø (1.0 mm)</td>
</tr>
</tbody>
</table>

**Press-fit connection (reference values per press-fit zone)**

The characteristic values may vary depending on the PCB type, the sleeve design, the press-fit contact and the process parameters, and thus deviate from the reference values.

* with a PCB thickness of ≥ 1.6 mm  |  ** ≥ 24 h (after storage at room temperature)

<table>
<thead>
<tr>
<th>Press-fit zone</th>
<th>Insertion force $F_{in}$</th>
<th>Push-out force $F_{out}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE04-10</td>
<td>≤ 70 N</td>
<td>≥ 20 N</td>
</tr>
<tr>
<td>EE06-15</td>
<td>≤ 120 N</td>
<td>≥ 40 N</td>
</tr>
<tr>
<td>EE08-15</td>
<td>≤ 160 N</td>
<td>≥ 50 N</td>
</tr>
<tr>
<td>EE08-19</td>
<td>≤ 180 N</td>
<td>≥ 50 N</td>
</tr>
</tbody>
</table>

For additional information and diagrams, please refer to the original document pages.
QUALITY

We are committed to ensuring the quality of the press-fit zones. During serial production, continuous process monitoring is carried out using cutting-edge camera systems and 3D measuring machines.

One of the most important characteristics of a press-fit area is the spring-force behaviour during the insertion process (spring-force curve) and the resulting force exerted on the hole wall. The spring-force curve is determined and analyzed during production.

In our testing laboratory, all appropriate tests are carried out to assess the press-fit connection. The laboratory works according to DIN EN 60352-5 as well as to customer specifications. The scope of the tests, the procedure and the characteristic values are agreed upon with the customer based on the application.

Qualification of the press-fit connection

In our testing laboratory, we provide the following tests to assess the press-fit connection:

- Visual and dimensional inspection
- Insertion and push-out force
- Micro sectioning and analysis
- Contact resistance
- Rapid temperature change (temperature shock)
- Climate sequence (cold, dry and humid heat, cyclical)
- Whisker analysis
- Etching

QUALIFICATION

Longitudinal and transverse micro section (EE08)
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