

ERNI D-Sub Connectors for THR (through hole reflow) Process



General

The THR method is an attractive option for processing wired components during SMT assembly without leaving the production line.

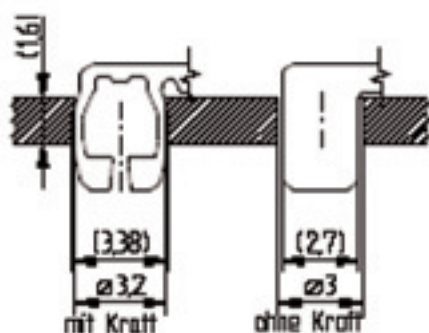
The new ERNI D-Sub connectors are reflow/lead-free process compatible and free of halogen. Temperatures greater than 260 °C can be sustained without exhibiting any visual or functional impairment.

Wired D-Sub connectors are automatically or manually placed in plated-through holes of a pcb. Prior to this, soldering paste required for the solder joints is positioned in these holes via paste printing. What follows is the traditional process of soldering in the reflow or vapor phase oven.

D-Sub connectors are available with or without assembly force, depending on the type of assembly process (automatic or manual).

It is practical to carry out a soldering paste calculation before converting to the THR method. Doing this will allow you to estimate in advance as to whether the existing solder for the given geometric data will be able to meet the required quality standards.

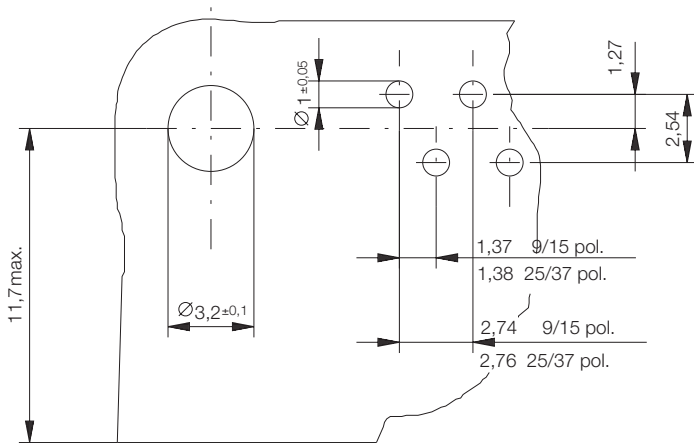
Clip with and without assembly force



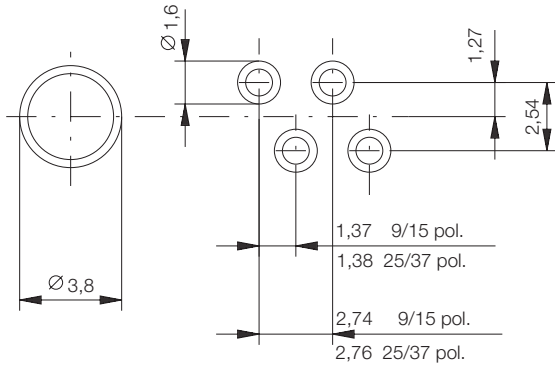
Layout Recommendations

Standard Right Angle D-Sub Connector

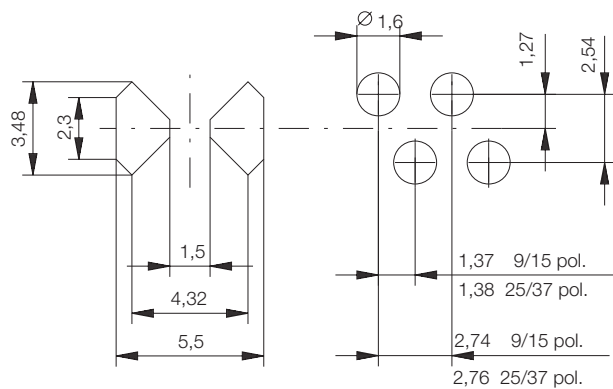
Layout, drilling plan



Cu plating

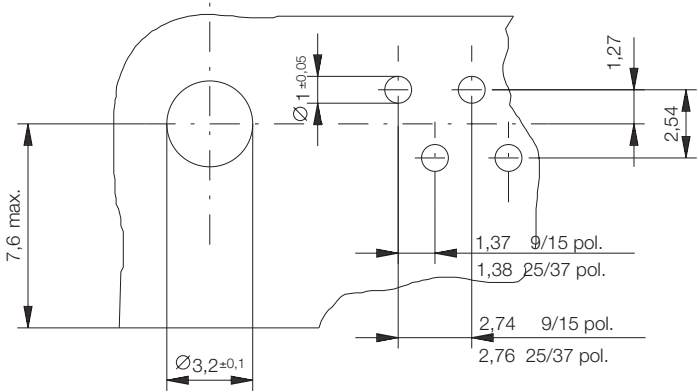


Paste printing stencil

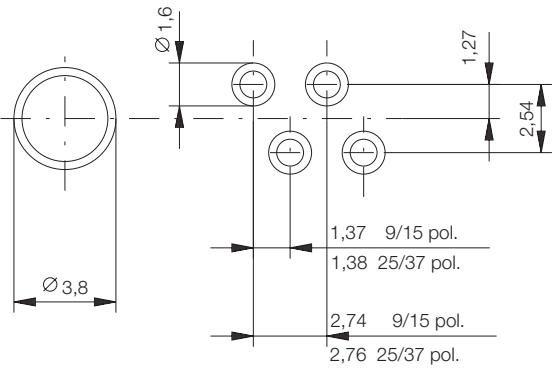


Eurostyle Right Angle D-Sub Connector

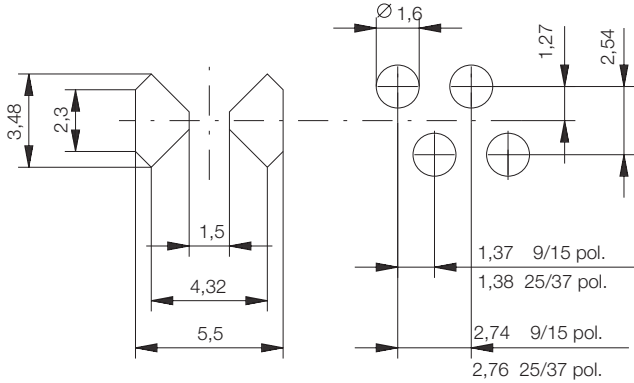
Layout, drilling plan



Cu plating

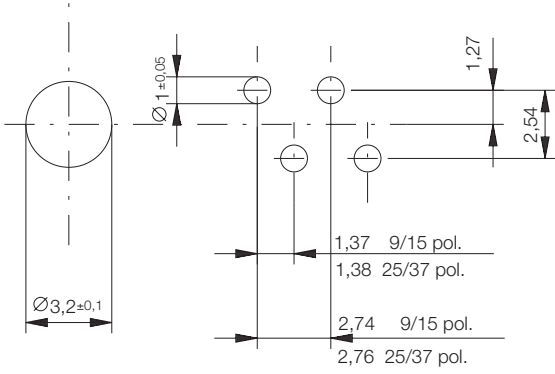


Paste printing stencil

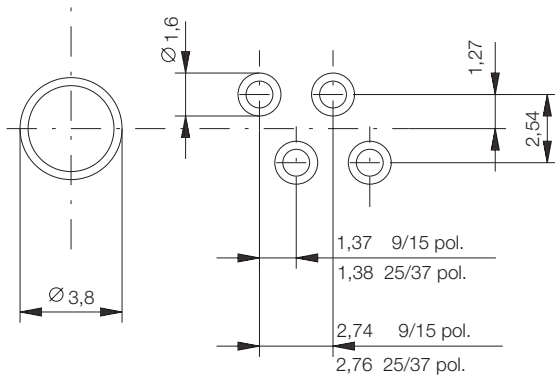


Vertical D-Sub Connector

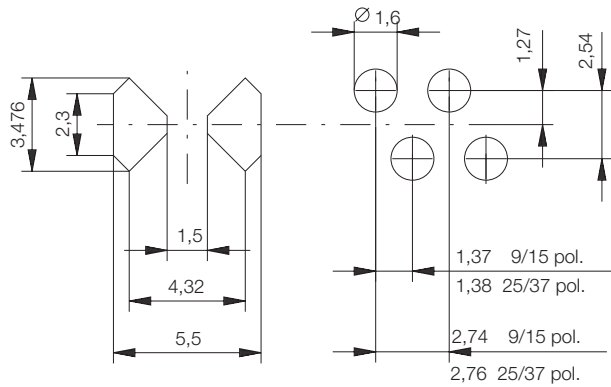
Layout, drilling plan



Cu plating



Paste printing stencil



Solder Paste Printing

In addition to other criteria, the placement of a sufficient, reproducible solder paste volume has turned out to be the main criterion for ensuring the quality of the solder joint as per IPC-A610.

The solder volume is determined by the stencil thickness and hole diameter as well as by the level of paste in the plated-through hole.



Solder paste printing component side view



Solder paste printing soldering side view

In order to avoid paste displacement and solder balls, it is advisable to use stencil apertures that are 10 % smaller than the pads.

The best results are achieved with a paste fill level of 100 %. This can be realized when a closed squeegee system is used. A double print in conjunction with an open squeegee system also can produce satisfactory fill levels.

Solder paste printing stencil:

Stencil thickness (steel)

150 μm – 200 μm

Stencil aperture

see drawings (page 2-4)

Solder paste SnPb or SnAgCu (lead-free)

Solder proportion

ca. 50 %



Paste type 3

solder ball size

20 – 40 μm

Required solder paste volume (based on nominal drill-hole diameter 1.0 mm)

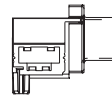
Bei unterschiedlichen Pastenfüllgraden / Bohrungsdurchmesser

	75 % solder joint	100% solder joint
Required paste volume	ca. 1.2 mm ³	ca. 1.45 mm ³
Achievable paste volume	ca. 1.5 mm ³	ca. 1.5 mm ³
Achievable solder joint form		

Relevant data for automatic assembly

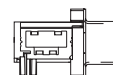
Weight (gram)

Standard Right Angle D-Sub Connectors



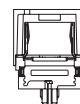
	9 pin	15 pin	25 pin	37 pin
Female without	6.70	8.50	11.52	15.03
Female with nut	6.99	8.79	11.84	15.27
Female with bolt	9.34	11.02	14.00	15.99
Male without	6.09	7.65	9.96	12.85
Male with nut	6.36	7.90	10.08	13.00
Male with bolt	8.52	10.23	12.33	15.39

Eurostyle Right Angle D-Sub Connectors



	9 pin	15 pin	25 pin	37 pin
Female without	5.70	7.41	9.99	13.19
Female with nut	5.85	7.54	10.24	13.44
Female with bolt	8.40	9.79	12.46	15.69
Male without	5.23	6.42	8.33	10.86
Male with nut	5.26	6.50	8.60	11.06
Male with bolt	7.68	9.02	10.69	13.22

Vertical D-Sub Connectors



	9 pin	15 pin	25 pin	37 pin
Female without	4.31	5.80	8.21	10.87
Female with nut	4.58	6.07	8.49	11.15
Female with bolt	5.45	7.01	9.09	11.72
Male without	3.57	4.94	6.41	10.62
Male with nut	4.00	5.21	6.69	10.89
Male with bolt	4.73	5.69	7.29	11.51

Pick and place point

see connector datasheet

Packaging

Tape and Reel

Tray

dimensions see datasheet

dimensions see datasheet

Reflow data

Common temperature profile

Temperature stability

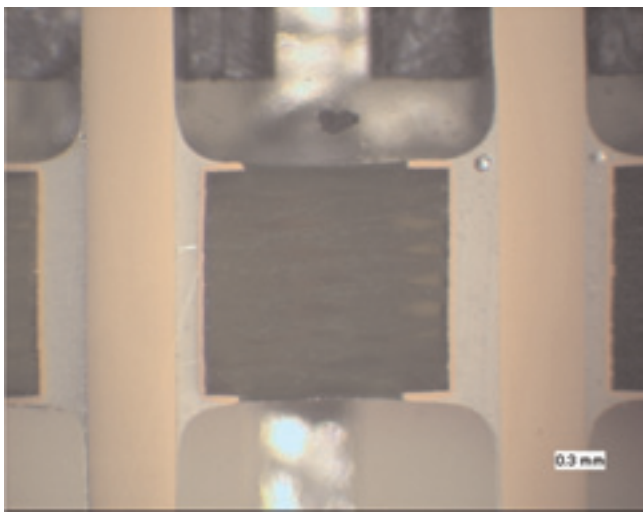
EN 61760-1

min. 3 x reflow solder (Peaktemp. 260 °C)

Soldering results

Soldering conditions:
1.6 mm PCB thickness ,
D-Sub THR Part number: 154204
Closed squeegee system 150µm stencil thickness
Vapor Phase soldered at 230 °C

Cross Section Signalpin



Cross Section Clip with Assembly Force

