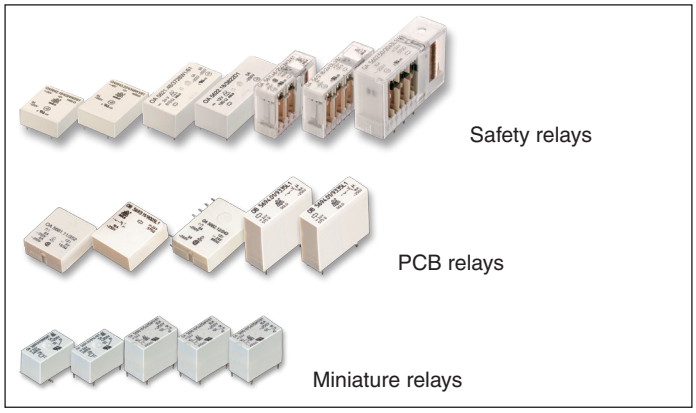
Application and processing instructions

Printed circuit board relays



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Foreword

All technical data and characteristic curves in our data sheets have been carefully determined in our test laboratory in accordance with the relevant standards and regulations.

Due to the large number of different applications, it is not possible for us to test all cases. The suitability of the relays for the intended application must be tested and approved by the user himself. The complete manufacturing process, such as assembling, soldering, washing, drying, etc., must also be specially considered and qualified by the user.

This documentation is intended to be an important guide for the user, with recommendations for the processing and use of our PCB relays.

Assembling

Our PCB relays can be assembled manually or automatically. The grid and the bore diameter must be carried out according to the specifications in the data sheet. The relays must not be fixed on the printed circuit board by bending the solder connections. This can change the relay parameters or damage the seal.

If the relays are to be fixed with an adhesive, it must be ensured that they are not damaged by inadmissibly high temperatures or the material used. The use of silicone in the vicinity of the relays must be avoided at all costs. Silicone may diffuse through the relay housings and cause contact problems.

For automatic assembly, the permissible acceleration values should be observed. Impact loads, e.g. due to falling, should also be avoided. In the event of a hard impact from a height of 0.5 m, accelerations of several 100 g can occur, which can cause damage inside the relay (e.g. cracks in plastic parts, reduction of contact forces, bouncing of the armature out of its bearing position). In case of doubt, these relays should no longer be used.

Soldering

The relays can be soldered by hand as well as in conventional wave soldering machines. The maximum temperature and soldering time specified in the corresponding data sheet must not be exceeded. In wave soldering systems, we recommend preheating at 130°C maximum. The time should be selected so that the relay just reaches this temperature. A possible soldering profile is listed in the standard DIN EN 61810-1, appendix N.
If a flux is used, it must not be aggressive or acidic. Also, only the underside of the PCB should be wetted.

Cooling of wash-proof relays

After wave soldering, the assembly must be cooled down as gently and stress-free as possible to the desired low and constant temperature in a cold air flow before the washing process.
If a washing process follows, this temperature must be adjusted as precisely as possible to the temperature level of the washing medium. The optimum cooling gradient for this must be determined individually for the relay or assembly under original process conditions. The recommended cooling gradient is in the range of 0.5K/s to 2.5K/s.
As part of the qualification of the assembly, the optimum cooling process must be determined and used as a basis for processing. This prevents possible damage, such as microcracks on the relays (and other nearby components).
A too rapid cooling or sudden temperature change, which could have a cooling shock effect on the assembly, must not occur.

Cleaning / Washing

The relays can be washed in a suitable cleaning medium according to the protection degree for wash-proof relays, RT III.
For environmental reasons, we recommend that you do not clean the assemblies. If cleaning is necessary for certain reasons, the following process criteria must be observed:

- Cooling down the assembly as described above
- The temperature of the washing medium should not exceed 55°C and the washing time should be as short as possible (e.g. 2 min)
- Do not use ultrasonic cleaning to avoid possible contact adhesions
- Do not use cleaning additives. If a detergent is used, ensure that it does not damage the relay or seal
- Avoidance of high pressure cleaning

Drying

The relays can be dried in a warm stream of air at a temperature of about 50 °C. In order to accelerate the drying process, the relays can be blown off with a compressed air jet of max. 1.5 bar, which also removes the residues of the washing medium between the relay base and the printed circuit board.

Coating, painting or potting

For some applications printed circuit boards have to be coated or sealed. Only relays with protection degree RT III should be used.
We recommend one-component lacquers based on epoxy or polyurethane resin which are applied by spraying. Silicones or materials containing silicone must not be used. Special suitability tests of the coating must be carried out.
Due to the capillary effect, the paints can creep between the relay and the printed circuit board. During the following drying or hardening process they may not cure completely. Lacquer vapours may then penetrate into the inside of the relay and impair its functionality.
If the PCB is sealed with the relays, the heat flow can be changed by the sealing. The user must carry out additional tests to check whether the performance data of the relays may need to be reduced.

All technical data in this list relate to the state at the moment of edition. We reserve the right for technical improvements and changes at any time.