

Surface Mount Soldering Recommendations for TO-263 and TO-268 Case Styles

The IXYS TO-263 and TO0268 surface mount packages have tinned terminals and bases to allow state-of-the-art SMD soldering. Due to the sizes of the packages, there are some special considerations to achieve a good solder bond between base and substrate, which will allow high power dissipation.

Soldering Techniques

The recommended soldering techniques are either reflow soldering with convection heating or vapor phase soldering, both of which require a preheating step. For the case of convection heating, IXYS recommends a suitable cover gas flow with gas temperature as close as possible to the maximum allowed package temperature. The advantage is a very homogeneous heating of the whole substrate or board and less stress for all devices. The gas should be preferably forming gas but pure nitrogen is also possible. This will allow the use of solder paste with a small amount of flux, which is still a requirement for good solder joints to power devices.

Infrared heating is less suitable due to the size and thickness of the packages and the thickness of the copper bases, which absorb very little radiation.

Soldering Profile

The soldering profile should be within the following limits:

- Heating and cooling ramps should not exceed 2K/s;
- Pre-heating at a maximum temperature of 160°C for a time of 60s is necessary.;
- The allowable peak surface temperature of the device is 250°C for 10s maximum.

This is only a guideline. The appropriate temperature profile has to be adjusted experimentally for each product.

Solder Joint

Voids in the solder joint under the package result in high thermal resistance and poor reliability. Increased solder thickness and tilted packages have the same effect. This is even more critical for power devices than for SO - packages. Therefore, tight control of these parameters must be done to achieve a low thermal resistance and reliable solder joint.