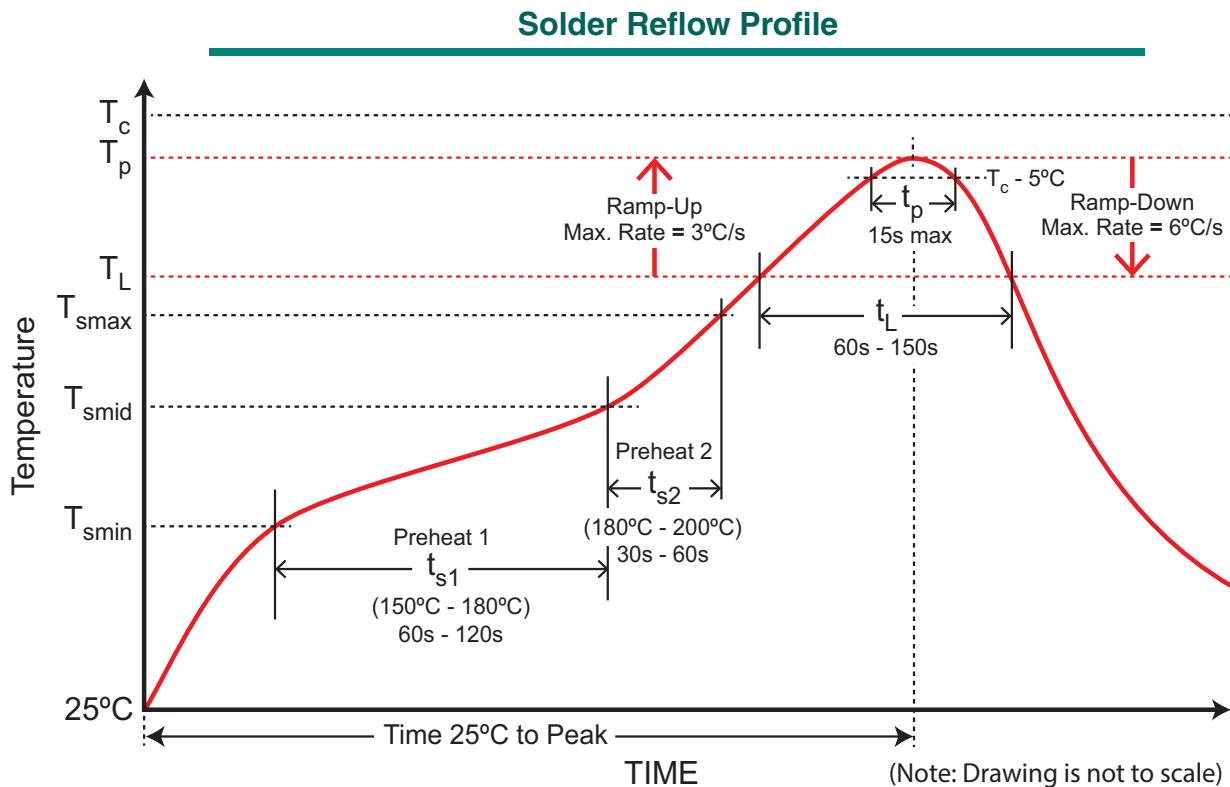


Pb-Free Solder Reflow Profile for Select Devices

IXYS Integrated Circuits Division is providing the following lead-free solder reflow temperature profile for a small number of optically coupled devices whose data sheet specifies the solder reflow profile given in Technical Brief **TB-200 "Pb-Free Solder Reflow Profile for Select Devices"** must be followed. This profile is similar to that provided in J-STD-020 with a few subtle differences to minimize damage during the reflow process caused by moisture retention of the package. One modification splits the Preheat stage into two sections, Preheat 1 and Preheat 2. Preheat 1 is used to improve water vapor removal from the package while Preheat 2 rounds out the preheat temperature increase specified in J-STD-020. The other modification to the JEDEC profile is the reduction of the maximum time the body temperature of the device is within 5°C of the classification temperature. This dwell time, identified as t_p in the profile below, is limited to 15 seconds.

In addition to these modifications the maximum ramp rate over any time range during "Time 25°C to Peak" is restricted to 3°C/s.



1. T_c - Classification temperature: maximum body temperature rating of the device as given in the data sheet.
2. T_p = Peak package body temperature during the soldering reflow process, $T_p \leq T_c$.
3. $T_L = 217^\circ\text{C}$ = Liquidus temperature of Pb-free solder.
4. Preheat / Soak period:
 - $T_{smin} = 150^\circ\text{C}$ = Body temperature at the beginning of the preheat step.
 - $T_{smid} = 180^\circ\text{C}$ = Temperature marking end of Preheat 1 and the beginning of Preheat 2.
 - $T_{smax} = 200^\circ\text{C}$ = Body temperature attained at the end of the preheat period.
5. t_L = Time maintained above T_L .
6. Time 25°C to Peak ≤ 8 minutes.
7. t_p = time within 5°C of classification temperature.
8. Maximum ramp rates are true maximums over any time range (not average).

Note: Body temperature is based on temperature sensor positioned at the center of the package surface facing upward during the solder reflow procedure.

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Specification: TB-200-R01
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11/10/2015