

RF MMIC Innovator

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Reflow Soldering Guide

for Surface Mount Devices



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1. Reflow Soldering Guide for Surface Mount Devices

This technical note provides general guidelines for a solder reflow process for BeRex surface mount products. The data used in this document is based on IPC/JEDEC standards. The reflow process consists of applying a Pb-free solder paste to a circuit board, placing devices onto the paste, and then conveying the board through an oven with successive heating elements of varying temperatures. In the oven, each board typically goes through the following stages:

- Gradual preheating
- Flux activation
- Reflow
- Controlled cooling process

The maximum temperature, the rate of heating, the time a device spends at each temperature, controlled heating, and controlled cooling are critical parameters for effective soldering.

Figure 1 and Table 1 show a sample temperature profile compliant to JEDEC standards. Different board designs use different number and types of devices, solder paste, reflow ovens, and circuit boards. No single temperature profile works for all possible combinations. One can use this example as a generic target to set up its own reflow process. Reflow process should adhere to the JEDEC profile limits as well as specifications and recommendations from solder paste manufacturer to avoid damaging the device and create a reliable solder joint.

2. Figure 1. Temperature Profile for Infrared or Convection Reflow

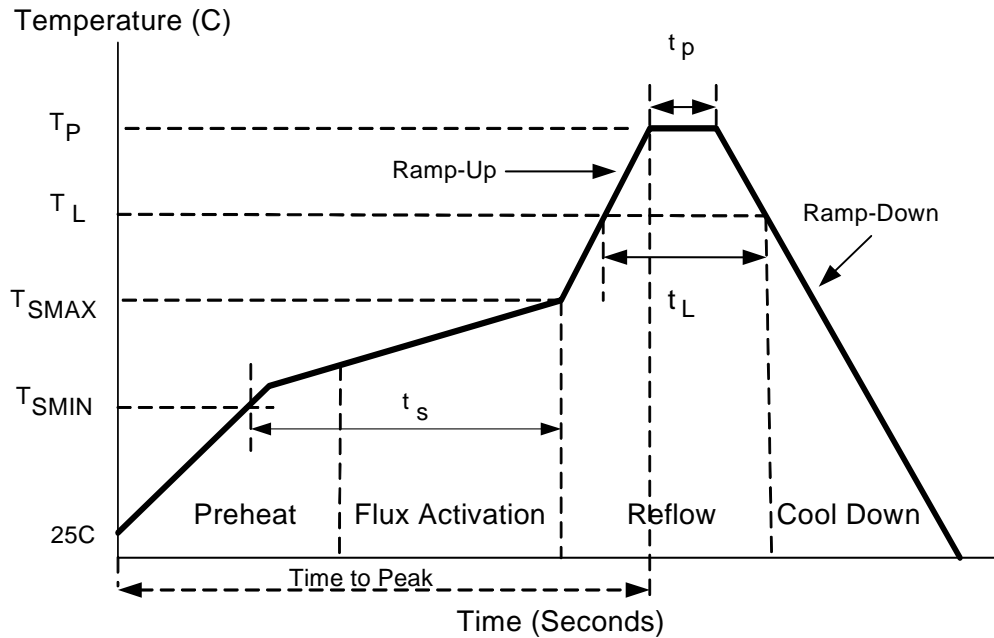


Figure 1. Temperature Profile for Infrared or Convection Reflow

3. Table 1. Reflow Profile

Parameter	Description	Pb-Free Package
Ramp-Up	Average Ramp-Up Rate (T_{SMAX} to T_p)	3 °C/second max.
T_{SMIN}	Preheat Peak Min. Temperature	150 °C
T_{SMAX}	Preheat Peak Max. Temperature	200 °C
T_p	Max. Reflow Temperature	260 (+0/-5) °C
T_s	Time between T_{SMIN} and T_{SMAX}	60-180 seconds
T_L	Solder Melting Point	218 °C
t_L	Time Maintained above T_L	60-150 seconds
t_p	Time within 5C of Peak Temperature	20-40 seconds
Ramp-Down	Ramp-down Rate	6 °C/second max.
Time to Peak	Time from 25 °C to Peak Temperature	8 minutes max.