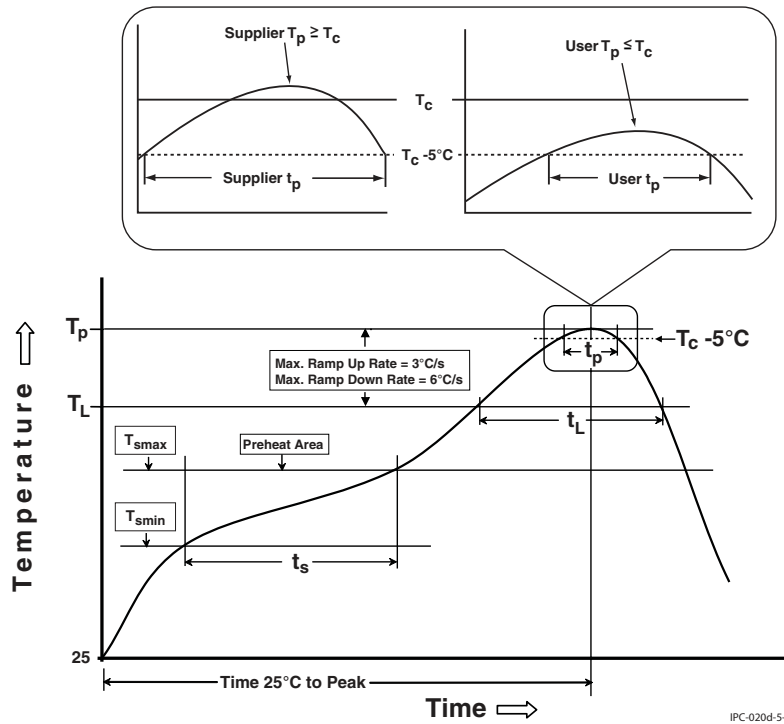


Reflow Soldering Profile, Per J-STD-020D, Table 5-2, Pb-Free Devices



IPC-020d-5-1

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat/Soak		
Temperature Min (T_{smin})	100°C	150°C
Temperature Max (T_{smax})	150°C	200°C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Ramp-up rate (T_L to T_P)	3°C/second max.	3°C/second max.
Liquidous temperature (T_L)	183°C	217°C
Time (t_L) maintained above T_L	60-150 seconds	60-150 seconds
Time (t_p)* within 5°C of the specified classification temperature (T_C)**, see Reflow Soldering Profile above.	20* seconds	30* seconds
Ramp-down rate (T_P to T_L)	6°C/second max.	6°C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.

* Tolerance for peak profile temperature (T_P) is defined as a supplier minimum and a user maximum.

- Note 1: All temperatures refer to the center of the package, measured on the package body surface that is facing up during assembly reflow (e.g., live-bug). If parts are reflowed in other than the normal live-bug assembly reflow orientation (i.e., dead-bug), T_p shall be within $\pm 2^\circ\text{C}$ of the live-bug T_p and still meet the T_c requirements, otherwise, the profile shall be adjusted to achieve the latter. To accurately measure actual peak package body temperatures refer to JEP140 for recommended thermocouple use.
- Note 2: Reflow profiles in this document are for classification/preconditioning and are not meant to specify board assembly profiles. Actual board assembly profiles should be developed based on specific process needs and board designs and should not exceed the parameters in Table 5-2. For example, if T_c is 260°C and time t_p is 30 seconds, this means the following for the supplier and the user.
 For a supplier: The peak temperature must be at least 260°C . The time above 255°C must be at least 30 seconds.
 For a user: The peak temperature must not exceed 260°C . The time above 255°C must not exceed 30 seconds.
- Note 3: All components in the test load shall meet the classification profile requirements.
- Note 4: SMD packages classified to a given moisture sensitivity level by using Procedures or Criteria defined within any previous version of J-STD-020, JESD22-A112 (rescinded), IPC-SM-786 (rescinded) do not need to be reclassified to the current revision unless a change in classification level or a higher peak classification temperature is desired. (Source Reference: J-STD-020-D1)

Reliability Test Ratings

This product is rated to meet the following test conditions:

Type	Parameter	Test Condition
Mechanical	Shock	MIL-STD-883, Method 2002, Condition B
Mechanical	Solderability	JESD22-B102-D Method 2 (Preconditioning E)
Mechanical	Terminal strength	MIL-STD-883, Method 2004, Condition D
Mechanical	Gross leak	MIL-STD-883, Method 1014, Condition C
Mechanical	Fine leak	MIL-STD-883, Method 1014, Condition A2 ($R_1 = 2 \times 10^{-8}$ atm cc/s)
Mechanical	Solvent resistance	MIL-STD-202, Method 215
Environmental	Thermal shock	MIL-STD-883, Method 1011, Condition A
Environmental	Moisture resistance	MIL-STD-883, Method 1004
Environmental	Vibration	MIL-STD-883, Method 2007, Condition A
Environmental	Resistance to soldering heat	J-STD-020D Table 5-2 Pb-free devices (2 cycles max)