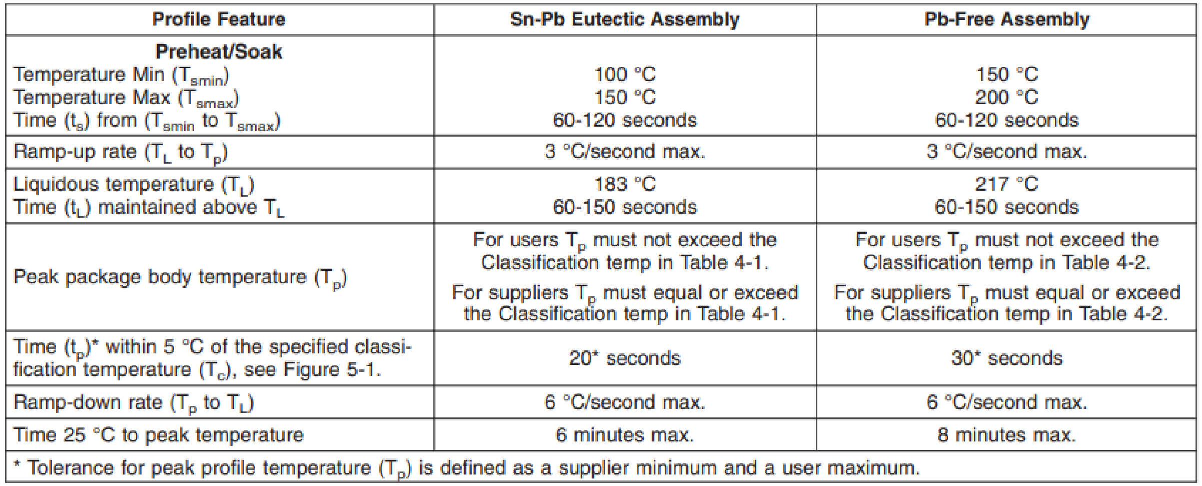
# Reflow Profile Guideline

**Reflow Condition:**

- can guarantee 3X IR reflow base on the Reflow profile(Figure 5-1) guideline in IPC/JEDEC J-STD-020E;
- Preheat/Soak: Pb-Free Assembly for 150°C~200°C for 60~120s;
- Average ramp-up rate(Ts to peak):3°C/second max.;
- Liquidous temperature maintained above Pb-Free 217°C for 60-150s;
- Time (tp)* within 5°C of the specified classification temperature Pb-Free 30s ;
- Note :

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 this table.
For example, if Tc is 260°C and time Tp 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.

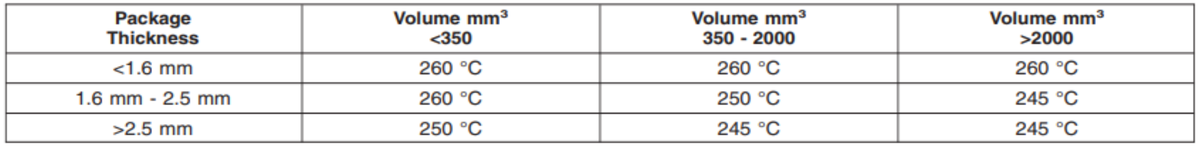
**Table 5-2 Classification Profiles**



| Profile Feature | Sn-Pb Eutectic Assembly | Pb-Free Assembly |
|---|---|---|
| **Preheat/Soak**<br>Temperature Min ($T_{smin}$)<br>Temperature Max ($T_{smax}$)<br>Time ($t_s$) from ($T_{smin}$ to $T_{smax}$) | 100 °C<br>150 °C<br>60-120 seconds | 150 °C<br>200 °C<br>60-120 seconds |
| Ramp-up rate ($T_L$ to $T_p$) | 3 °C/second max. | 3 °C/second max. |
| Liquidous temperature ($T_L$)<br>Time ($t_L$) maintained above $T_L$ | 183 °C<br>60-150 seconds | 217 °C<br>60-150 seconds |
| Peak package body temperature ($T_p$) | For users $T_p$ must not exceed the Classification temp in Table 4-1.<br>For suppliers $T_p$ must equal or exceed the Classification temp in Table 4-1. | For users $T_p$ must not exceed the Classification temp in Table 4-2.<br>For suppliers $T_p$ must equal or exceed the Classification temp in Table 4-2. |
| Time ($t_p$)* within 5 °C of the specified classification temperature ($T_c$), see Figure 5-1. | 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.

**Table 4-2 Pb-Free Process – Classification Temperatures ($T_c$)**



| Package Thickness | Volume mm³ <350 | Volume mm³ 350 - 2000 | Volume mm³ >2000 |
|---|---|---|---|
| <1.6 mm | 260 °C | 260 °C | 260 °C |
| 1.6 mm - 2.5 mm | 260 °C | 250 °C | 245 °C |
| >2.5 mm | 250 °C | 245 °C | 245 °C |

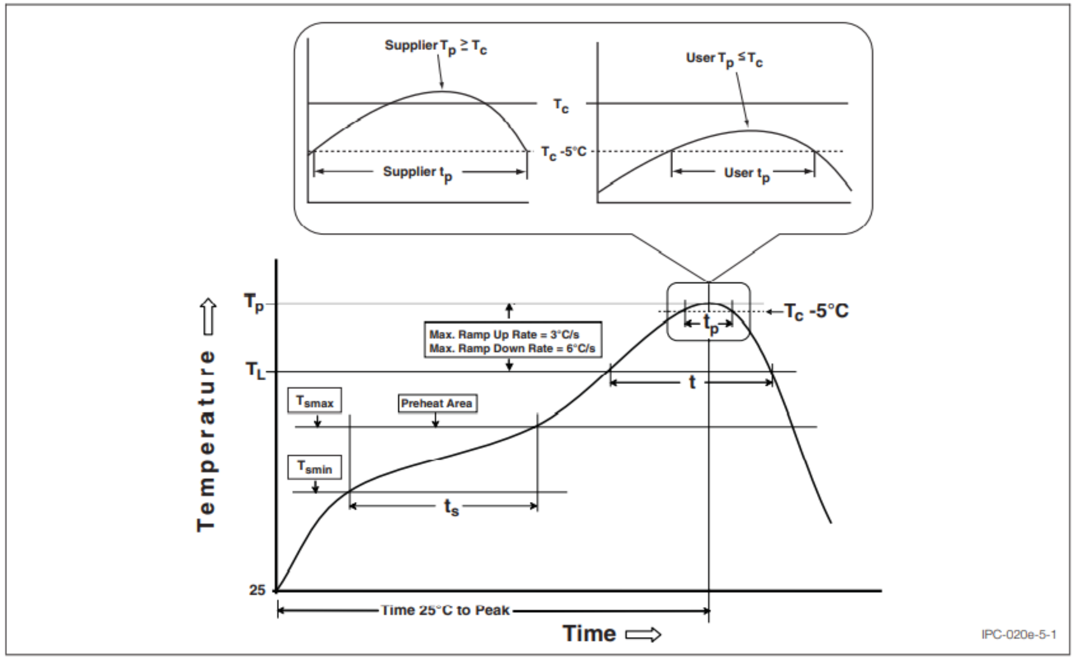


Figure 5-1 Classification Profile (Not to scale)