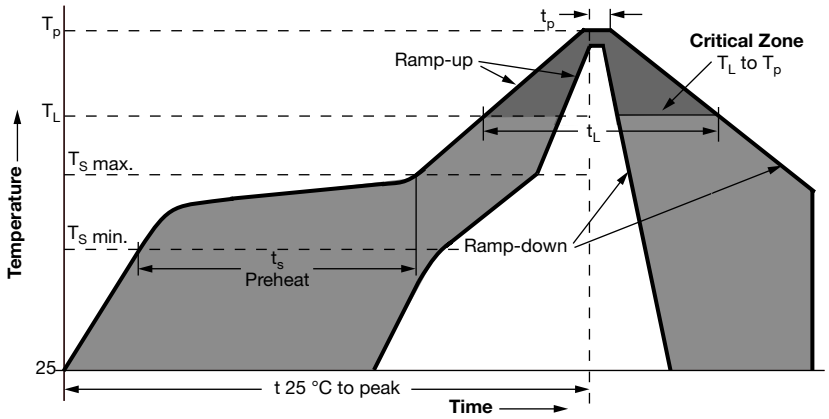
Film Resistor Division Products
Recommended for Thick Film Chip and Resistor Network Styles

SURFACE MOUNT SOLDERING

Solder methods for surface mount are IR, vapor phase and solder wave. IR is the most used at this time and discussion between users and vendors has resulted in recommendations for solder. A “Recommended Temperature Profile” for the IR reflow process is included which reflects the typical current usage.

TEMPERATURE PROFILE



REFLOW PROFILE

PROFILE FEATURE	TIN/LEAD REFLOW PROFILE	LEAD (Pb)-FREE REFLOW PROFILE
Average ramp-up rate ($T_{s\ max.}$ to T_p)	3 °C/s max.	3 °C/s max.
Preheat		
Temperature min. ($T_{s\ min.}$)	100 °C	150 °C
Temperature max. ($T_{s\ max.}$)	150 °C	200 °C
Time ($T_{s\ min.}$ to $T_{s\ max.}$) (t_s)	60 s to 120 s	60 s to 180 s
Time maintained above		
Temperature (T_L)	183 °C	217 °C
Time (t_L)	60 s to 150 s	60 s to 150 s
Minimum Peak Temperature ($T_{p\ min.}$)	215 °C	235 °C
Recommended Peak Temperature (T_p)	235 °C	250 °C
Maximum Peak Temperature ($T_{p\ max.}$)	260 °C	260 °C
Time within 5 °C of recommended Peak Temperature (t_p)	10 s to 30 s	10 s to 30 s
Ramp-down rate	6 °C/s max.	6 °C/s max.
Time 25 °C to Peak Temperature	6 minutes max.	8 minutes max.
As specified in IPC/JEDEC J-STD-020C		

As a general rule for all methods of soldering:

1. Preheat the components and the board to within + 100 °C of the soldering temperature for a minimum of 60 s. This ramping should not exceed 1-1/2 °C to 3 °C per s.
2. (a) Reflow soldering temperature should not exceed + 250 °C with a maximum time of 20 s.
   (b) Wave soldering temperature should not exceed + 260 °C with a maximum time of 5 s.
   (c) Vapor phase reflow soldering should not exceed + 220 °C with a maximum time of 40 s.
3. In all cases, gradual cooling to room temperature is recommended.

When profiling IR ovens, profile each board style with thermocouples embedded under components on the board. Expect the edges of the board to get 20 °C to 30 °C hotter than the board center.

Ultrasonic cleaning should be done with power regulated equipment. Older 25 kHz, unregulated equipment can damage joints and components.