



Application Note: AZD044  
IQ Switch® - ProxSense™ Series  
Lead Free Reflow Profile and Moisture Sensitivity Level

## 1 Introduction

All the Azoteq IQ Switch® - ProxSense™ Series products conform to IPC/JEDEC J-STD-020C Moisture/Reflow Sensitivity Classification for Non-hermetic Solid State Surface Mount Devices.

The summary of the moisture sensitivity levels is defined by the table below:

**Table 1.1 Moisture Sensitivity Levels as defined by J-STD-020C**

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS			
			Standard		Accelerated Equivalent	
	TIME	CONDITIONS	TIME	CONDITIONS	TIME	CONDITIONS
1	Unlimited	≤30 °C/85% RH	168	85 °C/85% RH		
2	1 year	≤30 °C/60% RH	168	85 °C/60% RH		
2a	4 weeks	≤30 °C/60% RH	696 <sup>2</sup>	30 °C/60% RH	120	60 °C/60% RH
3	168 hours	≤30 °C/60% RH	192 <sup>2</sup>	30 °C/60% RH	40	60 °C/60% RH
4	72 hours	≤30 °C/60% RH	96 <sup>2</sup>	30 °C/60% RH	20	60 °C/60% RH
5	48 hours	≤30 °C/60% RH	72 <sup>2</sup>	30 °C/60% RH	15	60 °C/60% RH
5a	24 hours	≤30 °C/60% RH	48 <sup>2</sup>	30 °C/60% RH	10	60 °C/60% RH
6	Time on Label	≤30 °C/60% RH	TOL	30 °C/60% RH		

**Note 1:** CAUTION – The “accelerated equivalent” soak requirements shall not be used until correlation of damage response, including electrical, after soak and reflow is established with the “standard” soak requirements or if the known activation energy for diffusion is 0.4 - 0.48 eV. Accelerated soak times may vary due to material properties, e.g., mold compound, encapsulant, etc. JEDEC document JESD22-A120 provides a method for determining the diffusion coefficient.

**Note 2:** The standard soak time includes a default value of 24 hours for semiconductor manufacturer’s exposure time (MET) between bake and bag and includes the maximum time allowed out of the bag at the distributor’s facility.

If the actual MET is less than 24 hours the soak time may be reduced. For soak conditions of 30 °C/60% RH the soak time is reduced by 1 hour for each hour the MET is less than 24 hours. For soak conditions of

60 °C/60% RH, the soak time is reduced by 1 hour for each 5 hours the MET is less than 24 hours.

If the actual MET is greater than 24 hours the soak time must be increased. If soak conditions are 30



°C/60% RH, the soak time is increased 1 hour. for each hour that the actual MET exceeds 24 hours. If soak conditions are 60 °C/60% RH, the soak time is increased 1 hour. for each 5 hours that the actual MET exceeds 24 hours.

**Note 3:** Supplier may extend the soak times at their own risk.

The summary of the reflow profile is defined by the table and diagram below:

**Table 1.2 Pb-Free Reflow Profile**

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3° C/second max.
<b>Preheat</b>	
- Temperature Min (T <sub>smin</sub> )	150 °C
- Temperature Max (T <sub>smax</sub> )	200 °C
- Time (T <sub>smin</sub> to T <sub>smax</sub> ) (ts)	60-180 seconds
Time maintained above:	
- Temperature (T <sub>L</sub> )	217 °C
- Time (t <sub>L</sub> )	60-150 seconds
Peak Temperature (T <sub>p</sub> )	260 °C
Time within 5°C of actual Peak Temperature (tp) <sup>2</sup>	20-40 seconds
Ramp-down Rate	6 °C/second max.
Time 25°C to Peak Temperature	8 minutes max.

**Note 1:** All temperatures refer to topside of the package, measured on the package body surface.

**Note 2:** Time within 5 °C of actual peak temperature (tp) specified for the reflow profiles is a “supplier” minimum and “user” maximum.



## Temperature

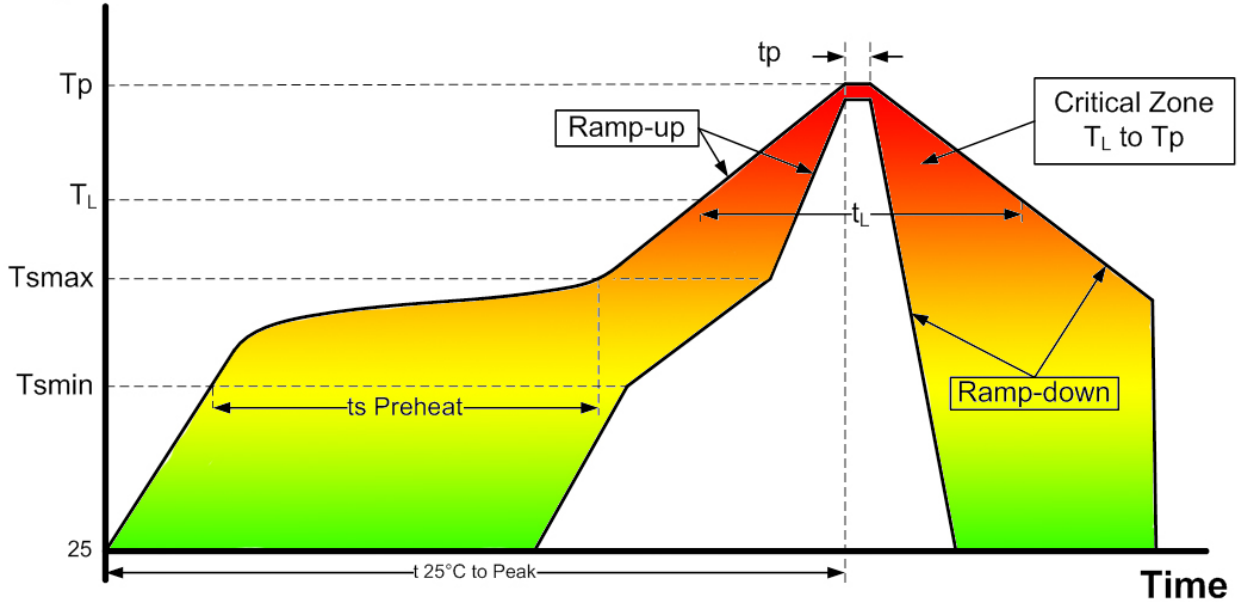


Figure 1.2 J-STD-020 Pb-Free Reflow Profile

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