TECHNICAL REFERENCE DOCUMENT: SOLDERING

Soldering Information — Surface mounting

Products intended for surface mount assembly are qualified for use in a Pb-free forced convection or vapor phase reflow soldering process.

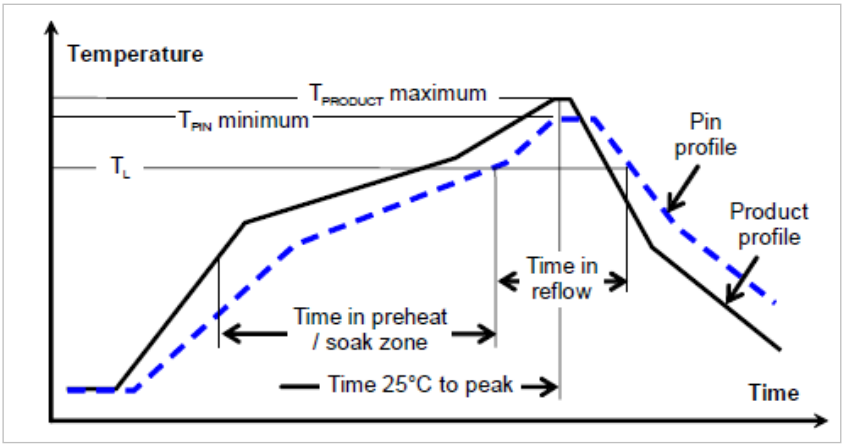
The surface mount product is intended for forced convection or vapor phase reflow soldering in Pb-free processes.

The reflow profile should be optimised to avoid excessive heating of the product. It is recommended to have a sufficiently extended preheat time to ensure an even temperature across the host PCB and it is also recommended to minimize the time in reflow.

A no-clean flux is recommended to avoid entrapment of cleaning fluids in cavities inside the product or between the product and the host board, since cleaning residues may affect long time reliability and isolation voltage.

T_L	is the typical solder melting (liquidous) temperature
$T_{product}$	is measured on the power module's hotspot
T_{pin}	is measured on the power module output power pins' solder joints at the customer board

General relfow process specification		Pb-free, SAC305
Average ramp-up rate ($T_{product}$)		3 °C/s max
Typical solder melting temp.	T_L	221° C
Min/Max. reflow time above T_L	T_{pin}	60 –150 s
Min. pin temp.	T_{pin}	235 °C
Peak product temp.	$T_{product}$	245 °C
Average ramp-down ($T_{product}$)		6°C/s max
Max. time 25° C to peak		8 minutes



Typical soldering profile

Pb-free solder classification

For Pb-free solder processes, the product is qualified for MSL 3 according to IPC/JEDEC standard J-STD-020E.

Products reflow processes - Lead-free (Pb-free) solder processes

For Pb-free solder processes, a pin temperature (T_{MIN}) in excess of the solder melting temperature (T_L, 217 to 221 °C for SnAgCu solder alloys) for more than 30 seconds and a peak temperature of 235 °C on all solder joints is recommended to ensure a reliable solder joint

During reflow $T_{PRODUCT}$ must not exceed 245 °C at any time.

Dry Pack Information

The products are delivered in standard moisture barrier bags according to IPC/JEDEC standard J-STD-033 (Handling, packing, shipping and use of moisture/reflow sensitivity surface mount devices).

Using products in high temperature Pb-free soldering processes requires dry pack storage and handling. In case the products have been stored in an uncontrolled environment and no longer can be considered dry, the products must be baked according to J-STD-033.

Surface Mount Assembly and Repair

Assembly

This product is **not** recommended for assembly on the bottom side of a customer board. If such an assembly is attempted, components may fall off the product during the second reflow process.

Repair

For a successful repair (removal and replacement) of a LGA product, a dedicated rework system should be used. The rework system should preferably utilize a reflow station and a bottom side heater might also be needed for the operation.