



# ASSEMBLY RECOMMENDATIONS

FOR

## LEAD-FREE BGA MODULES (RoHS component)

**ONLY APPLICABLE FOR MODULES GUARANTEED BY 3D PLUS FOR  
AUTOMATIC REFLOW**

**(Stated in 3D PLUS Certificate Of Conformity and/or End Item Data Package)**

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## 1. Handling

3D PLUS modules must be handled with care. Operators are requested to wear antistatic gloves and antistatic brackets. The use of tools that could damage the sides of the modules is also forbidden.

## 2. Storage

In order to avoid a degradation due to humidity, components, must be stored according to the following procedure:

- Shelf life in sealed bag : 12 months 5~35°C and  $\leq 85\%$  relative humidity (RH).
- After the sealed bag is opened, devices must be stored at  $\leq 30\%$  relative humidity and temperature 22°C +/-2°C. The floor life is 72 hours (JEDEC 020C – Level 4).

Note : Device container cannot be subjected to temperature  $> 80^\circ\text{C}$ , so devices must be baked on another tray

## 3. Reflow guidelines

### 3.1. Solder paste

Solder paste INDIUM SMQ92J has been successfully used for the assembly of our modules. Its composition is Sn63% -Pb37% ; Pastes of same composition can be used and with Ag content up to 2 % also.

### 3.2. Stencil thickness and aperture design

Taking into account the diameters of the pads on the mother-board of 400  $\mu\text{m}$ , with copper pad defined design, the aperture of the stencil must be 430  $\mu\text{m}$  with a thickness of 150  $\mu\text{m}$ . The criteria for complete paste release are :

- Width / Thickness  $> 1.5$
- $(\text{Length} \times \text{Width}) / 2 \times (\text{Length} + \text{Width}) \times \text{Thickness} > 0.66$

For BGA, width = length = aperture diameter.



### **3.3. Prebaking**

Before the beginning of the reflow, the modules must have been baked 150°C- 24 h or 125°C-48h according the JEDEC 020C standard.

### **3.4. Reflow equipment**

A convection oven with 10 heating zones is recommended. We have successfully mounted our modules with a Paragon 150 BTU equipment with nitrogen atmosphere.

### **3.5. Reflow profiles**

The main characteristics of reflow profile for modules are :

Measured values on solder balls	Range
Slope pre-heating (40°C – 130°C)	1 – 2 °C/s
Soak time 130°C-170°C	60 - 120 s
Reflow time > 183°C	30 - 60 s
Peak temperature	205 - 215 °C

For the BGA package, the maximum peak temperature is 225°C (see JEDEC 020C standard).