1216NGFF

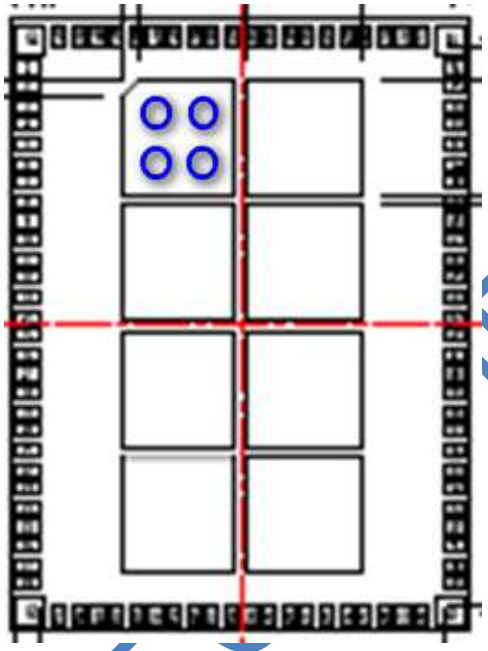
Layout Guide

Version 0.4

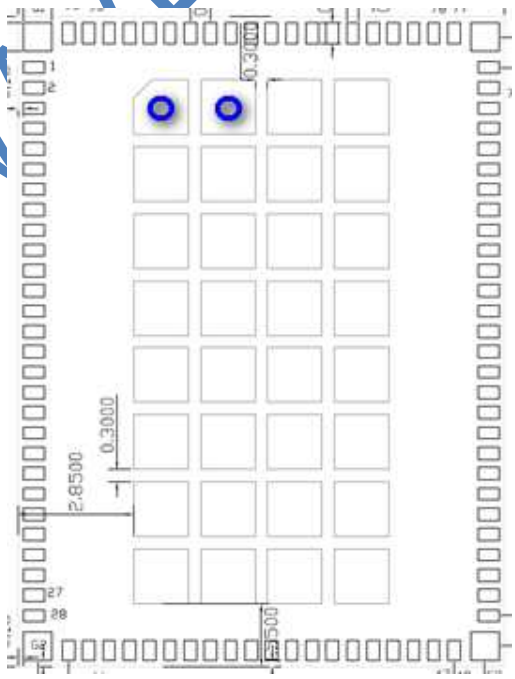
Document release	Date	Modification	Initials	Approved
Version0.1	2014/04/03	Initial version	Allen Huang	Chihhao Liao
Version0.2	2014/04/15	Revise Reflow Spec	Allen Huang	Chihhao Liao
Version 0.3	2014/09/18	Update Spec：If SMT process needs twice reflow	Allen Huang	Chihhao Liao
Version 0.4	2015/06/05	Add Baking Condition Add Solder Printer Reference	Allen Huang	Chihhao Liao

1. 1216NGFF Module stencil and Pad opening Suggestion

- Stencil thickness：0.10~0.12mm
- GND Pad opening size suggestion: <1/2 Pad Area
- Function Pad opening size suggestion: Max. 1:1
- Shared Stencil open method：Based on 32 pad be opened



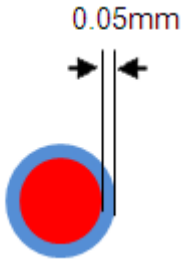
(8GND Pad)



(32GND Pad)

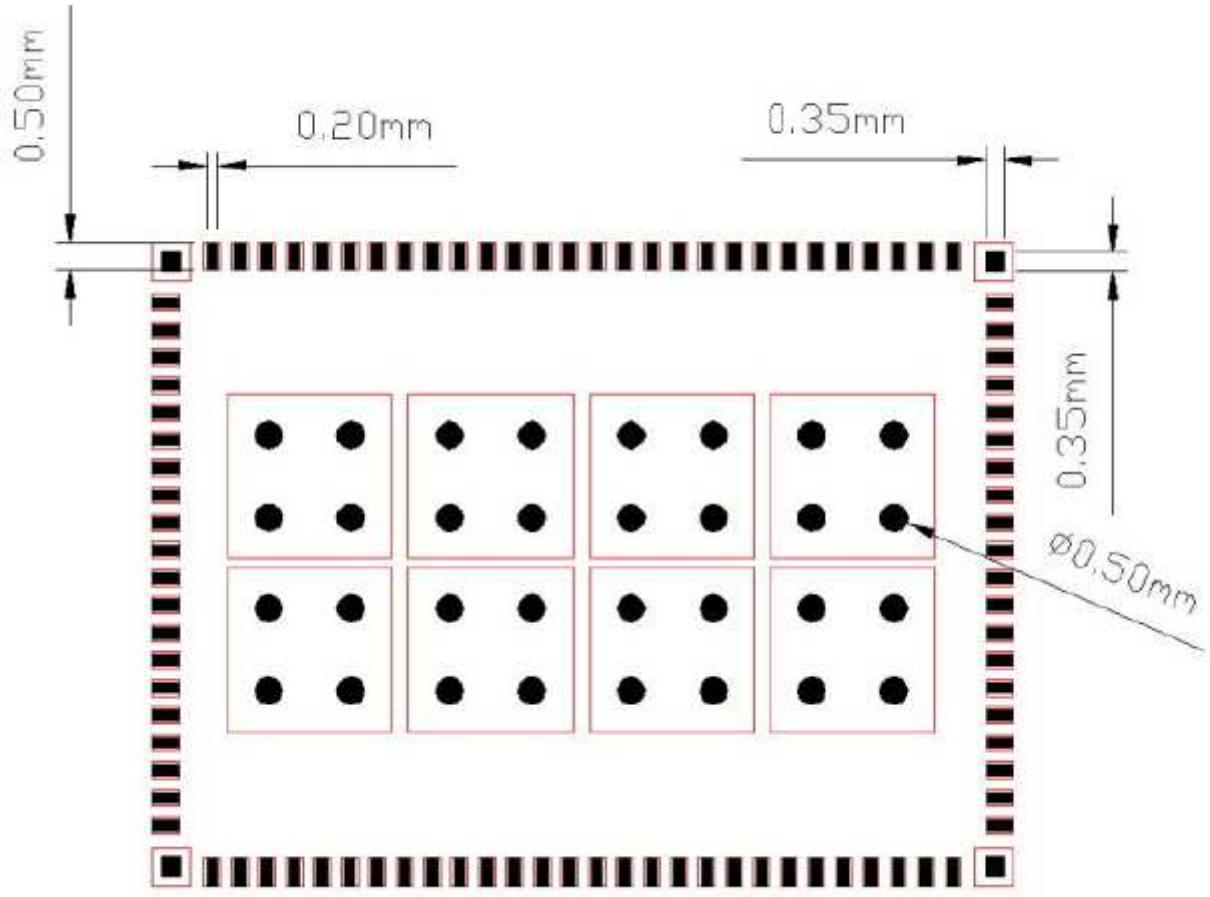
2. 1216 NGFF Module pad opening Suggestion

- IF Cu Pad size : 0.85mm
- Pad opening suggestion: 0.75mm



PS: This opening suggestion just for customer reference, please discuss with AzureWave engineer before you start SMT.

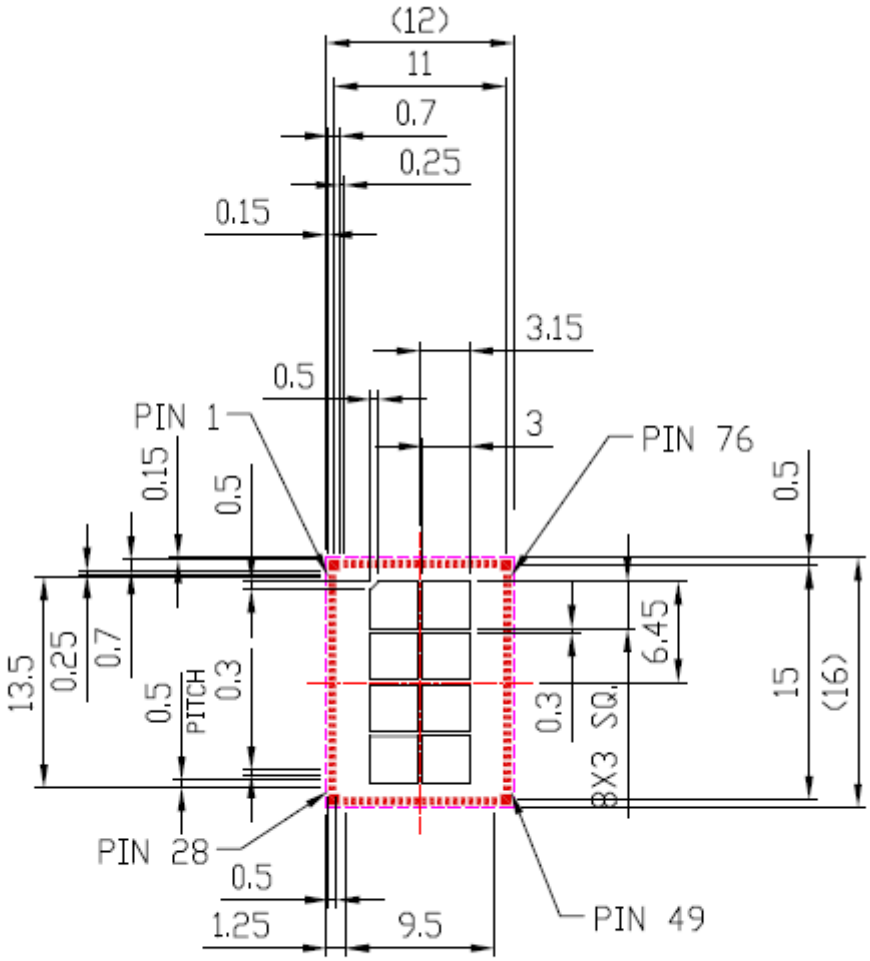
- Solder Printer Opening Reference:



3. Mechanical Characteristics

- The size of the NGFF package module is listed below:

TOP View PCB Layout Footprint (8 GND Pad)

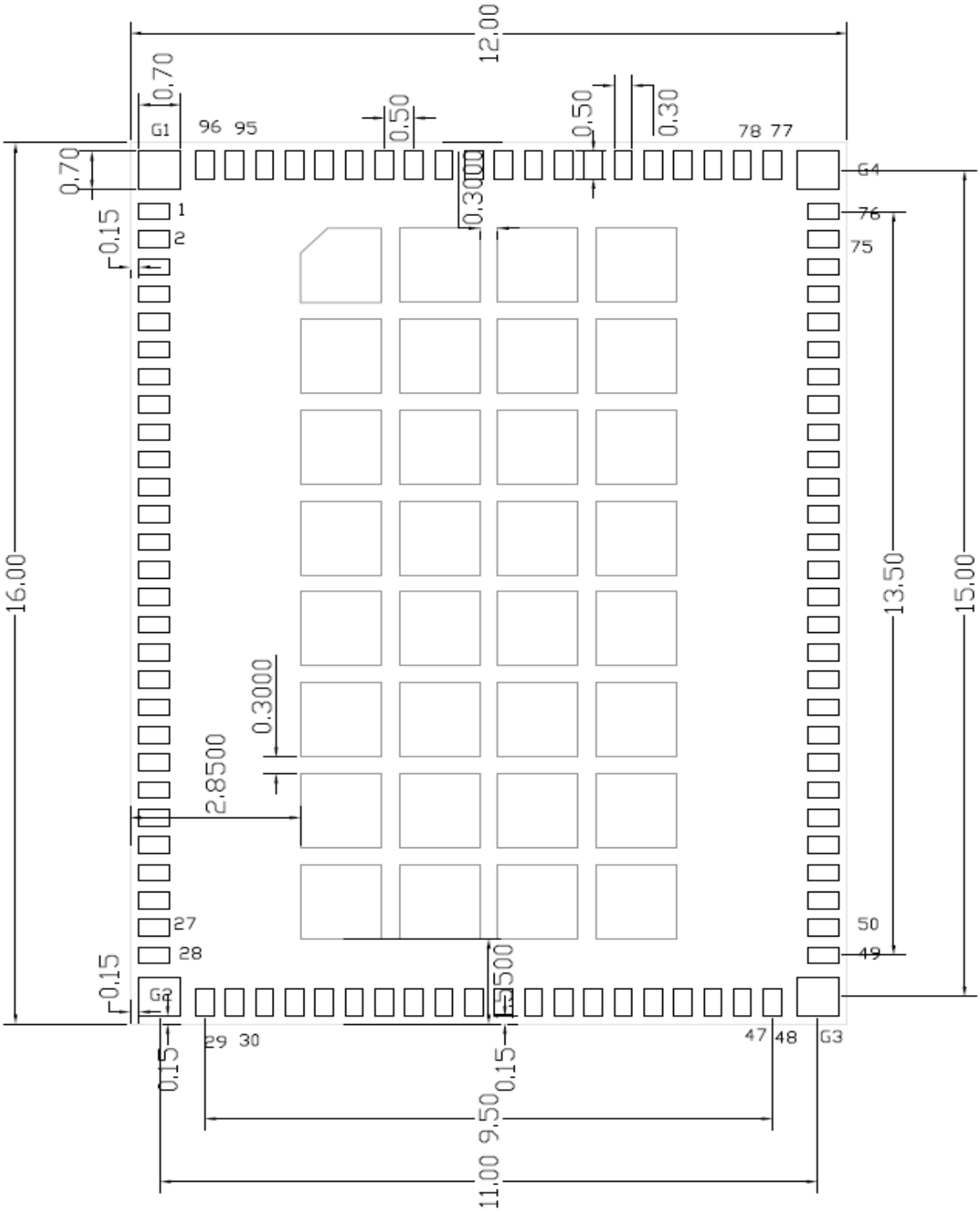


Recommended Footprint Pattern

TOP VIEW

- The size and thickness of the NGFF package module is listed below:

TOP View PCB Layout Footprint (32 GND Pad)



TOP VIEW

4. SMT Process Suggestion

- **Reflow soldering profile**

Table 4-1 SnPb Eutectic Process - Classification Temperatures (T_c)

Package Thickness	Volume mm^3 <350	Volume mm^3 ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

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

Package Thickness	Volume mm^3 <350	Volume mm^3 350 - 2000	Volume mm^3 >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

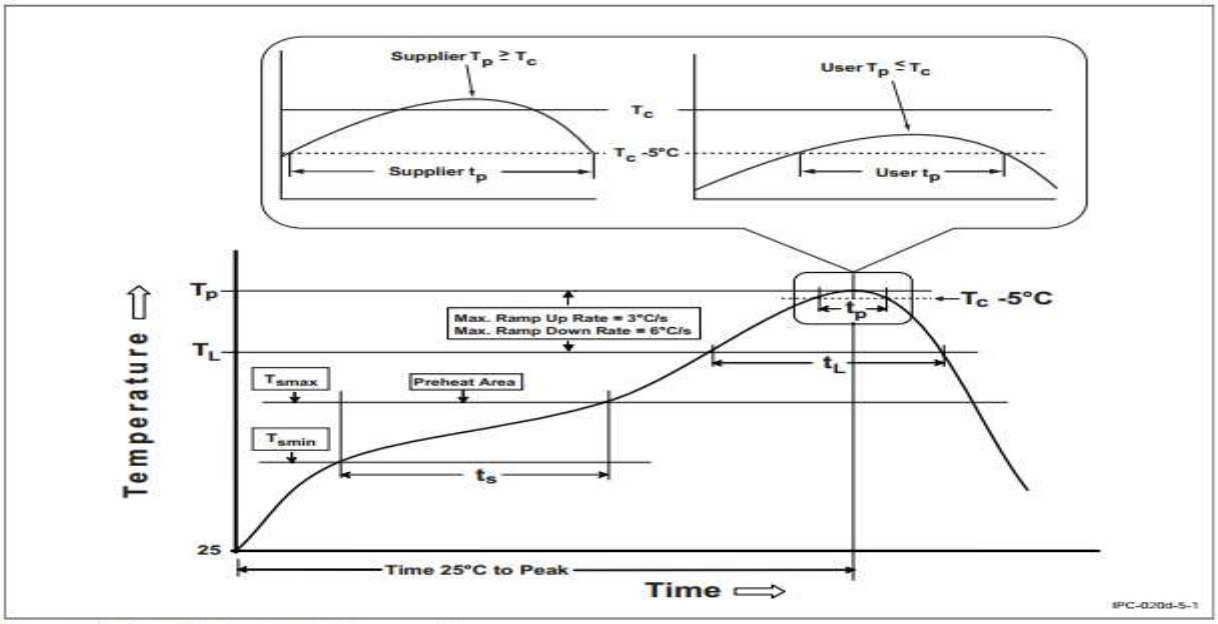


Table 5-2 Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat/Soak Temperature Min (T_{smin}) Temperature Max (T_{smax}) Time (t_s) from (T_{smin} to T_{smax})	 100 °C 150 °C 60-120 seconds	 150 °C 200 °C 60-120 seconds
Ramp-up rate (T_L to T_p)	3 °C/second max.	3 °C/second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L	183 °C 60-150 seconds	217 °C 60-150 seconds
Peak package body temperature (T_p)	For users T_p must not exceed the Classification temp in Table 4-1. 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. 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.		

Note: 1. Recommend to supply N_2 for reflow oven

2. N_2 atmosphere during reflow (O_2<300ppm)

- **Module IC SMT preparation**
  - **Shelf life in sealed bag: 12 months, at <30℃ and <60% relative humidity (RH)**
  - **After bag is opened, devices that will be**
    - **Baked for 24 hours at 125+-5℃ with tray**
    - **Re-baked required after last baked with window time 168 hours**
  - **Baking Condition:**
    - **High Temperature Carriers**
      - **Exceeding Floor Life > 72 hours: bake @125℃ 8 hours**
      - **Exceeding Floor Life ≦ 72 hours: bake @125℃ 6 hours**
    - **Low Temperature Carriers**
      - **Exceeding Floor Life > 72 hours: bake @60℃ ≦5% RH 6 days**
      - **Exceeding Floor Life ≦ 72 hours: bake @60℃ ≦5% RH 3 days**
  - **Recommend to oven bake with N2 supplied**
  - **Recommend end to reflow oven with N2 supplied**
  - **Recommend to store at ≦10% RH with vacuum packing**
  - **If SMT process needs twice reflow:**
    - **Process flow: (1) Bottom side SMT and reflow → (2) Top side SMT and reflow**
      - **Case 1: Module IC mounted on Top side. Need to bake when bottom side process over 168 hours window time**
      - **Case 2: Module IC mounted on bottom side, follow normal bake rule before process**

Note: Window time means from last bake end to next reflow start that has 168 hours space.