Module Secondary SMT

User Guide

LCC Module Series

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About the Document

History

Revision	Date	Author	Description
1.0	2012-08-28	Gavin HOU	Initial
2.0	2013-08-26	Gavin HOU	Added the description of stencil-making in Chapter 4.2.
2.1	2013-12-19	Gavin HOU	Modified Figure 3: Inward Shrinking and Outward Moving.

Content

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1 Introduction

This document describes the process of Quectel modules' secondary SMT and disassembly. It is applied for all Quectel modules in LCC package.

2 Information about Modules

2.1. Package Type

LCC type.

2.2. Packing Methods

Quectel provides the following packing types:

- Tray Packing
- Reel Packing

Figure 1: Tray Packing and Reel Packing

3 Requirements on Chip Mounter

3.1. Mounter

- Component feeder: Support auto-tray feeder and auto-reel feeder
- Image processing: Optical plummet centering
- Diameter of nozzle: Select the suitable nozzle according to the module size

NOTE

The recommended diameter of nozzle should be not less than 40% of the module's shorter side. Such as module size: 25mm × 20mm. Nozzle diameter should be more than 8mm.

3.2. Soldering Equipment

Support Hot-air soldering.

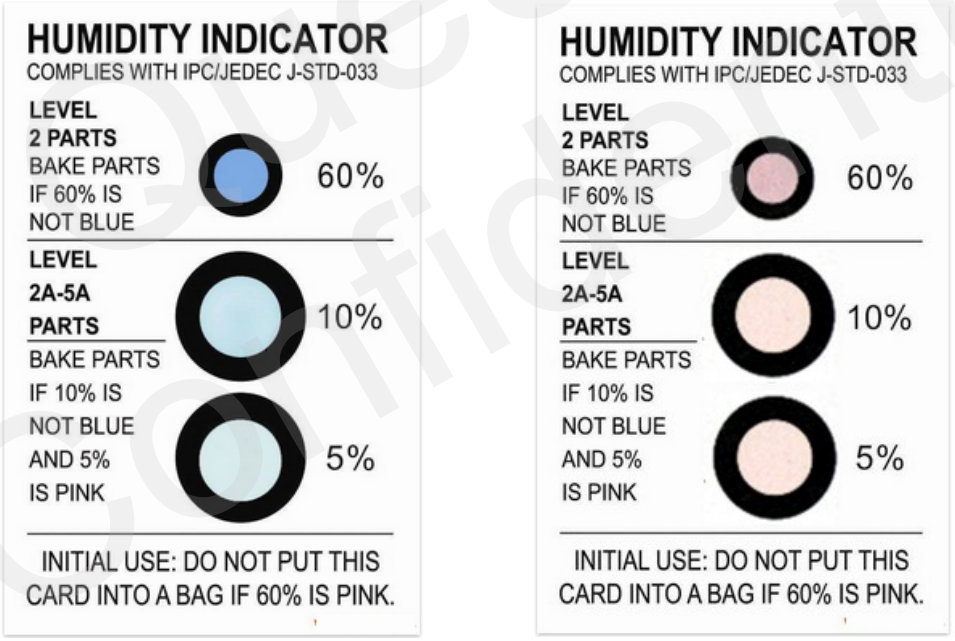
4 Attentions for Manufacturing

4.1. MSL and Moisture-proof Requirement

Quectel SMD module is sensitive to moisture absorption. According to IPC-JEDEC standard, the MSL of Quectel SMD modules are defined as “4”.

To prevent SMD module from permanent damage, baking before reflow is required in following cases:

- Humidity indicator card: At least one circular indicator is no longer blue.
- The seal is opened and the module is exposed to air for more than 72 hours.



Normal **Not blue**

Figure 2: Humidity Indicator

NOTES

1. If the color of the indication card is turned to pink, bake the module for 48 hours under 125℃.
2. Take out the module from the package and put it on the high temperature fixture. All modules must be mounted within 24 hours after finishing baking, otherwise put them in the dry box.

4.2. Stencil Design Requirement

To ensure the solder paste is enough and soldering reliability, the stencil should be partly stepped-up on the top surface. The differences are shown in the table below.

Module	Stencil-making Requirements
M10/M12/M72/M80/M85/M95 UC20/UC15	**The stencil, where module is placed, should be stepped-up to 0.2mm.** **The hole of the stencil, relative to the host PCB footprint of the module, is shrunken inward by 0.1mm and moved outward by 0.2-0.3mm.**
L10/L16/L20/L26/L30/L50/L70/L76/L80	**The stencil, where module is placed, should be stepped-up to 0.13mm.** **The hole of the stencil, relative to the host PCB footprint of the module, is shrunken inward by 0.1mm and moved outward by 0.3-0.5mm.**

h1: The hole of the stencil is shrunken inward by 0.1mm.
h2: The hole of the stencil is moved outward by 0.2-0.3mm or 0.3-0.5mm according to different module type.

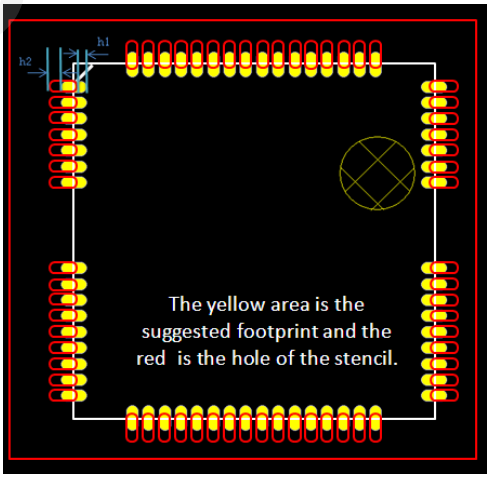


Figure 3: Inward Shrinking and Outward Moving

Figure 4: Step-up Stencil Area

NOTES

1. The hole of stencil's components, which has a distance about 5mm away from the edge of the module, should be shrunken by 10%~30% of the actual hole size.
2. **You can optimize stencil-making depending on the actual situation.**
3. **Inward shrinking and outward moving are relative to the host PCB footprint of the module. For details on the recommended footprint, please refer to the Hardware Design of the corresponding modules.**

4.3. Mounting Process

4.3.1. Load Materials

For tray packing, to ensue mounting accuracy, dedicated tray fixture is recommended when placing the module.

4.3.2. Automatic Placement

Select the suitable nozzle according to the module size. To keep module's stability, please ensure that the nozzle is placed in the center of gravity center when mounting the module. Module's pad should be put on the solder paste of motherboard PCB's pad after module is mounted.

Figure 5: Automatic Placement

Figure 6: Mounted Picture

4.4. Reflow

Refer to the recommended ramp-soak-spike reflow profile in the Figure 7.

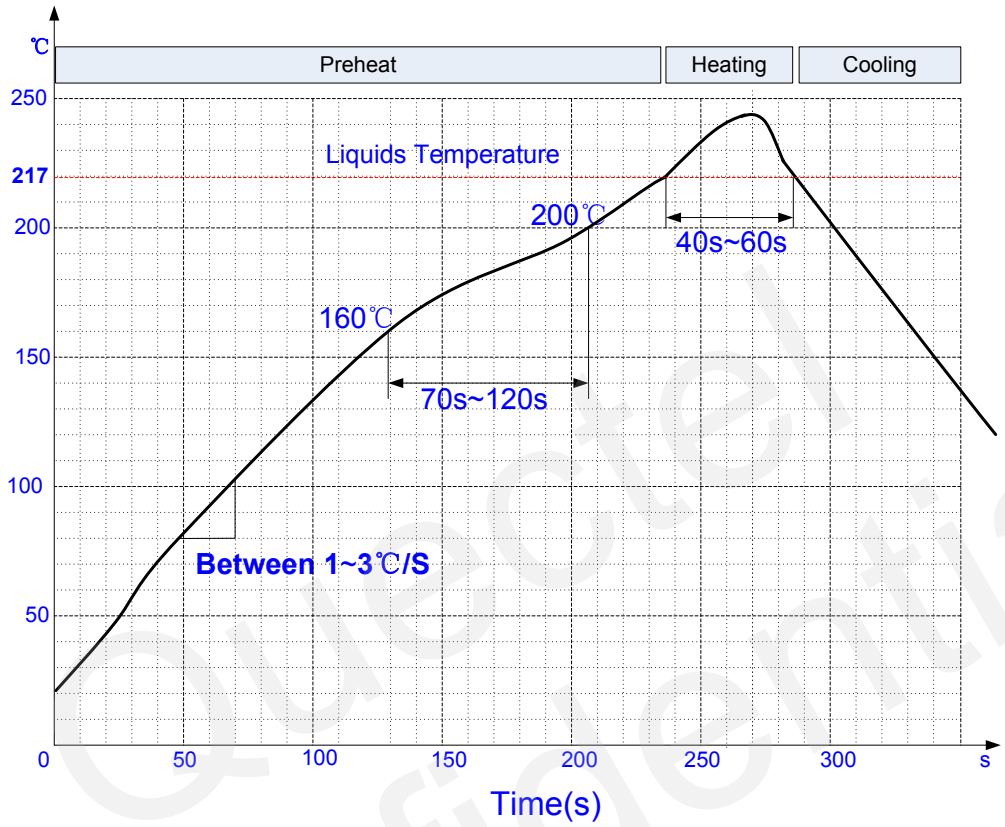


Figure 7: Ramp-soak-spike Reflow Profile

NOTE

You can optimize ramp-soak-spike reflow profile based on the actual situation.

5 Disassembly

Please use the SMD Rework Station to heat the pads of the module in the host board. The temperature of the SMD Rework Station should be about 350℃ in order to release enough heat. The wind speed should be adjusted according to actual situation.

When the host board is heated, the distance between the host board and the wind outlet should be from 1cm to 3.5cm. Move the wind outlet along the edge of the module in uniform rotation. When all of the solder are melted, take off the module along the diagonal direction with tweezers. The time of the whole process should be no more than 250 seconds.

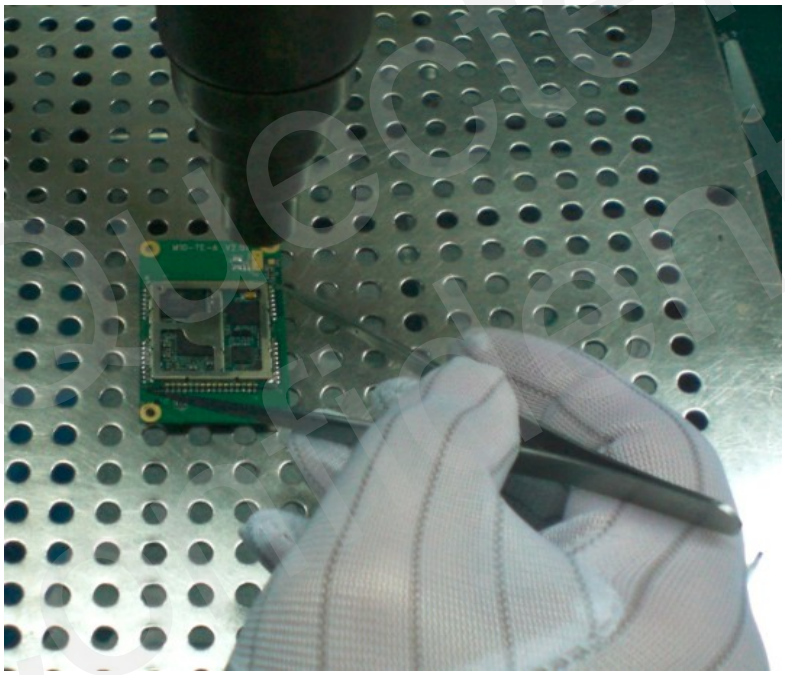


Figure 8: Remove Module

After disassembly, wait a moment until the module and the host board cool down. When the module has been removed, please guarantee that the solder paste on the host board must be smooth and there is no short circuit between two pins.

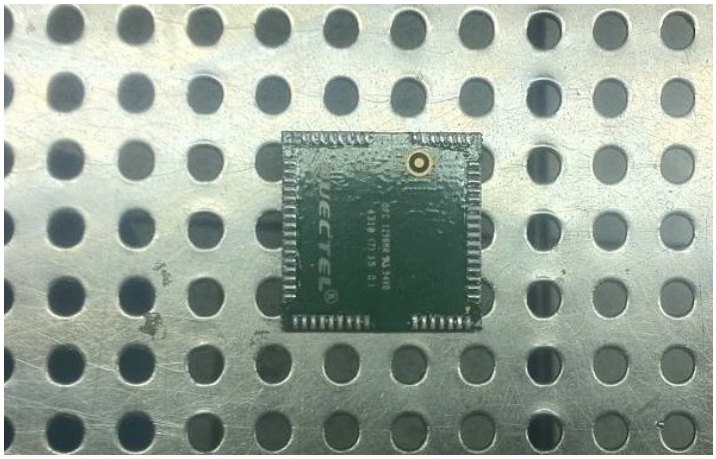


Figure 9: Module Soldering

6 Appendix Reference

Table 1: Terms and Abbreviations

Abbreviation	Description
LCC	Leadless Chip Carriers
SMT	Surface Mount Technology