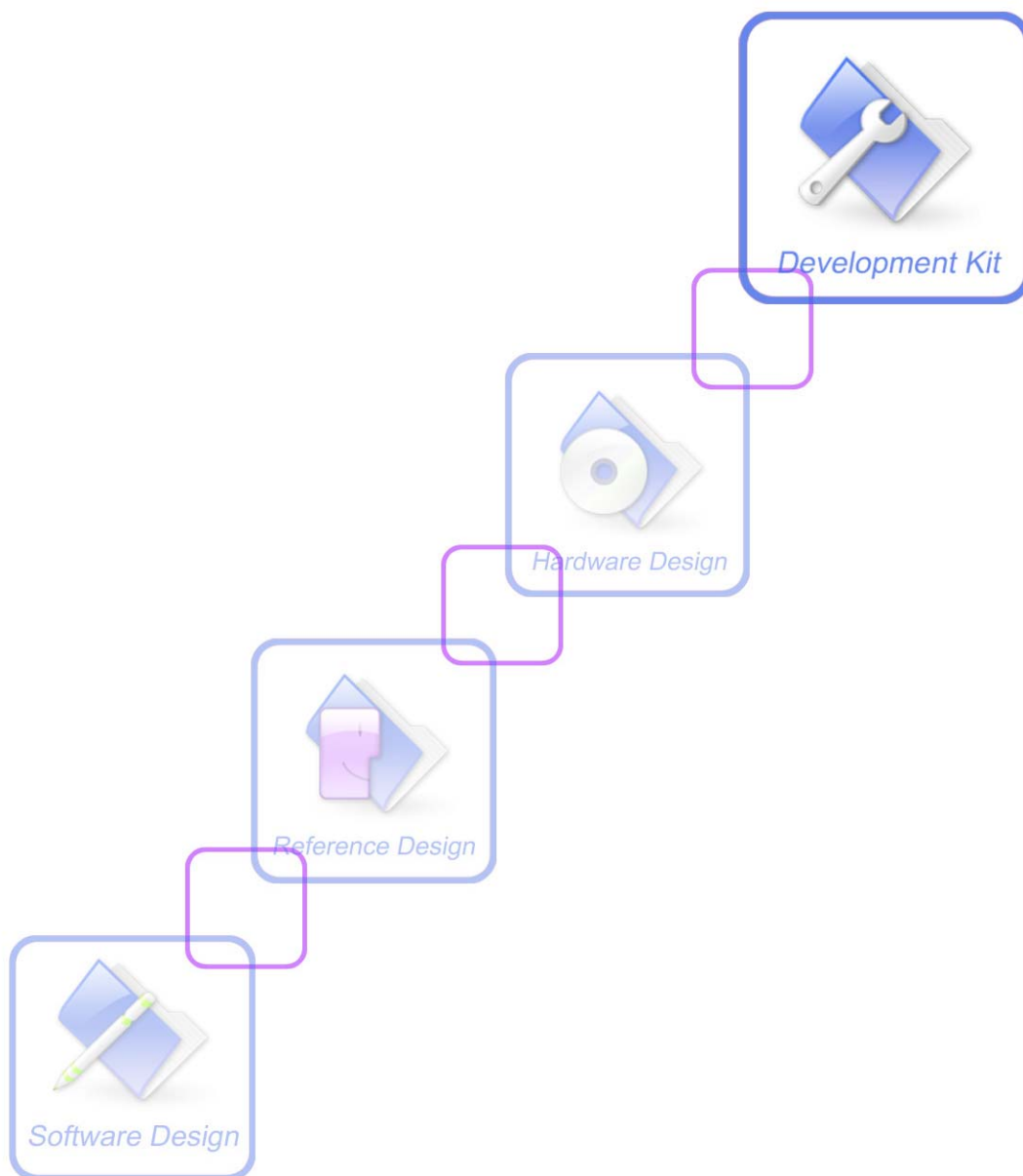


SMT Guidelines

Module Secondary SMT UGD_V1.15



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Version History

Date	Version	Description of change	Author
2008-09-10	01.01	Origin	
2008-10-06	01.02	Add the description of store and moisture-proof	Yu Feng
2008-10-27	01.03	Modify the description of packing types	Judy
2009-1-13	01.04	Modify the description of Moisture-proof requirement	Judy
2009-5-21	01.05	Add The Moisture Sensitivity Level of SIM340DZ	Zhouqiang
2009-12-28	01.06	Add The Inspection Criteria	Huang Qiuju
2010-1-22	01.07	Modify the Solder Paste Printing	Huang Qiuju
2010-02-03	01.08	Modify the Solder Paste Printing	Huang Qiuju
2010-08-03	01.09	Modify The Moisture Sensitivity Level of SIM300D etc	Huang Qiuju
2011-12-5	01.10	Add SIM5320 series	Li Bing
2012-6-27	01.11	Modify the Solder Paste Printing and Reflow times of SIM5320 series	Li Bing
2012-11-1	01.12	Modify the table 1 and table 3	Song Jialin
2013-04-09	01.13	Modify the table 3	Song.jialin
2013-08-12	01.14	Update the table 1	Yongqian Qi
2014-05-07	01.15	Add SIM5350 series description; Add PCBA cleaning description.	Yang Hongliang

1 Scope of the document

This document applies to all products of the SIMCom, which include:
GSM/GPRS/EDGE/TD-SCDMA/WCDMA /SRD surface mount technology modules.

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2 SMT Overview

2.1 Package Types

The SMT types of SIMCom products include LGA type and PTH type.

2.2 Packing Types

SIMCom provides following packing types:

1. Tape Packing
2. Reel Packing

2.3 Mounter Requirements

SIMCom SMT modules support Auto-tray component feeder, and, laser, vision, laser and vision mix-up component alignment.

The diameter of nozzle is recommended in the 5.0mm to 10.0mm range.

2.4 Soldering Equipment Requirements

SIMCom SMT modules support Hot-air soldering.

2.5 PCBA Cleaning

PCBA cleaning is not needed after routine SMT operation. Usually, PCBA needs cleaning after manual welding.

SIMCom recommends to use anti-static brush cleaning of the pads, then baking is needed. Do not immerse the module directly in cleaning fluid.

Do not use ultrasonic cleaning.

3 SMT Manufacturing Process

This chapter describes the whole process of the module secondary SMT manufacturing including solder paste printing, placing SMD and preheat/reflow.

Almost all the manufacturing process of all SMT modules is similar. The following process is illustrated using the SIM300D-TE SMT manufacture.

3.1 The Moisture Sensitivity Level

The moisture sensitivity level (MSL) of SIMCom modules are shown on table1 according to the IPC-JEDEC standard.

Table 1: The Moisture Sensitivity Level of SIMCom modules

Module	Level
SIM900	3
SIM900A series	3
SIM900D	3
SIM900L	3
SIM900-DS	3
SIM900E	3
SIM900R	3
SIM908	3
SIM928/928A/968	3
SIM800W/840W series	3
SIM800E/840E	3
SIM800V/840V series	3
SIM800DS	3
SIM800L/SIM800H	3
SIM800 series	3
SIM808	3
SIM800G	3
G590E	3
SIM500W/540W	3
SIM4100D	3
SIM4100L	3

SIM300D/340D	3
SIM300W/340W	3
SIM20/30	3
SIM08	3
SIM18	3
SIM28	3
SIM28C	3
SIM28M/SIM28ML	3
SIM68	3
SIM68R/RB	3
SIM68V/VB	3
SIM68M	3
SIM68E	3
SIM33ELA	3
SIM39EA/SIM39EAU	3
SIM2000 series	3
SIM6320 series	5
SIM5350 series	5
SIM5320 series	5
SIM5360 series	5
SIM5310 series	5
SIM700D	6

NOTES:

Please pay attention to the floor life before secondary soldering process starts.

Table 2: Moisture Classification Level and Floor Life

Level	Floor Life (out of bag) at factory ambient $\leq 30^{\circ}\text{C}/60\%\text{RH}$ or as stated
1	Unlimited at $\leq 30^{\circ}\text{C}/85\%\text{RH}$
2	1 year
2a	4 weeks
3	168 hours
4	72 hours
5	48 hours
5a	24 hours
6	Mandatory bake before use. After bake, it must be reflowed within the time limit specified on the label.

NOTES:

If the vacuum package is not open for 6 months or longer than the packing date, baking is also recommended before re-flow soldering.

3.2 Moisture-proof Requirement

Because of its sensitivity to moisture absorption, SIM700D should be baked sufficiently before re-flow soldering. Otherwise SIM700D will be at the risk of permanent damage during re-flow soldering. SIM700D should be baked 192 hours at temperature $40^{\circ}\text{C} \pm 5^{\circ}\text{C} / -0^{\circ}\text{C}$ and $<5\%$ RH for low-temperature device containers, or 72 hours at temperature $80^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for high-temperature device containers. Care should be taken if that plastic tray is not heat resistant. SIM700D modules should be taken out for preheating, otherwise the tray may be damaged by high-temperature heating.

3.3 Solder Paste Printing

The squeegee should push the paste across the surface of the stencil that allows the paste to fill the stencil openings and down to the PCB. The force on the squeegee should be adjusted so as to produce a clean stencil surface on a single pass.

NOTES:

For different modules, the thickness of stencil foil and the recommended footprint are also different. The differences are shown in table 3:

Table 3: Stencil foil and pad length of different modules

Module	Thickness of stencil foil (mm)	Pad length (mm) (shows in figure 1)	
		Inside(A)	Outside(B)
SIM900	0.15	0.8	0.8
SIM900A series	0.15	0.8	0.8
SIM900D	0.25	1	1
SIM900L	0.15	0.8	0.8
SIM900-DS	0.15	0.8	0.8
SIM900E	0.13	--	--
SIM900R	0.15	0.8	0.8
SIM908	0.15	0.8	0.8
SIM928/928A/968	0.15	0.8	1.0
SIM800W/840W series	0.15	0.8	0.8
SIM800E/840E	0.15	0.8	0.8
SIM800V/840V series	0.15	0.8	0.8
SIM800DS	0.15	0.8	0.8
SIM800L/SIM800H	0.12	--	--

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SIM800 series	0.15	0.8	0.8
SIM808	0.15	0.8	0.8
SIM800G	0.15	1.2	1.2
SIM500W/540W	0.25	1	1
SIM20/30	0.25	1	1
SIM08	0.15	0.8	0.8
SIM18	0.15	0.75	0.75
SIM28	0.15	0.8	0.8
SIM28C	0.15	0.8	0.8
SIM28M/SIM28ML	0.15	1.0	1.0
SIM68	0.15	1.0	1.0
SIM68R/RB	0.15	0.8	0.8
SIM68V/VB	0.15	0.8	0.8
SIM68M	0.15	1.0	1.0
SIM68E	0.15	0.75	0.75
SIM33ELA	0.15	1.0	1.0
SIM39EA/SIM39EAU	0.15	1.0	1.0
SIM2000 series	0.15	0.8	0.8
SIM6320 series	0.13	0.8	1
SIM5350 series	0.12	--	--
SIM5320 series	0.13	0.8	1
SIM5360 series	0.13	0.8	1
SIM5310 series	0.13	0.8	1
SIM700D	0.25	1	1
SIM300DZ	0.25	1	1

NOTES:

For LGA modules, for example SIM5350 module, the large ground pads at the bottom in the middle need diagonal thermal pad handle during PCB designing, which could not be placed by through hole.

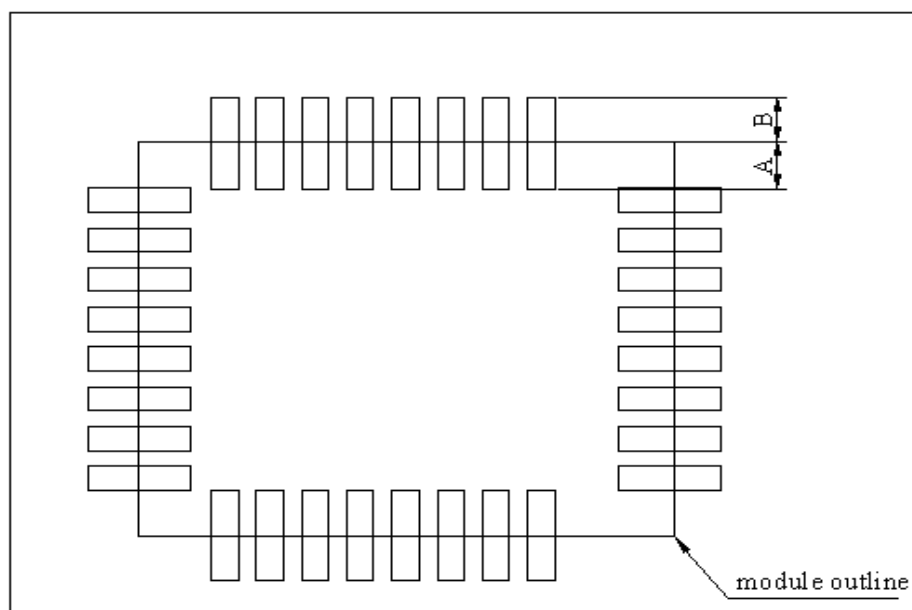


Figure 1: The recommended pad design

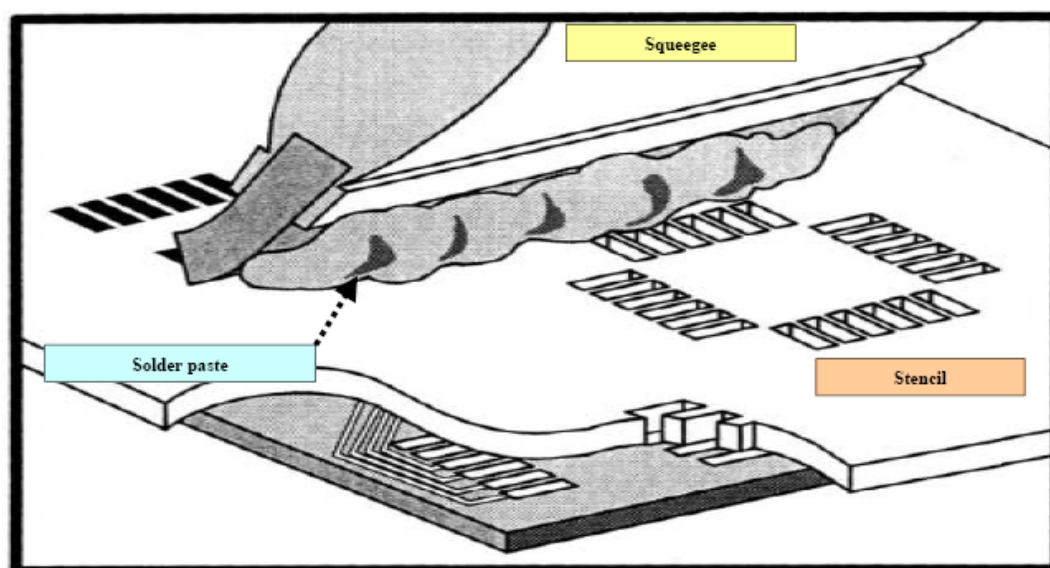


Figure 2: Paste application

3.4 Mounting Process

The module should be soldered lastly in your mounting process and can be soldered only once. And if the motherboards are integrated to a multiple printed panel, pay attention that the motherboards on the panel should all be in the same direction (like figure 3).

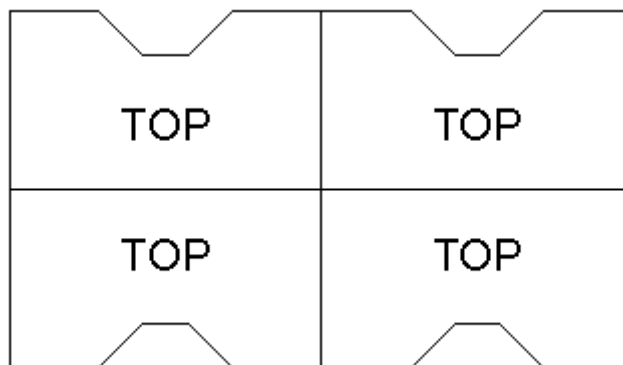


Figure 3: multiple printed panel of motherboards

3.4.1 Manual Assembly

Put 10 modules to the standard tray feeder and assemble into the mounter (**JUKI2060**).



Figure 4: Manual assembly

3.4.2 Automatic Placement

The operator should program the position of the tray as following parameters to let the mounter complete the automatic placement.

- layers
- The total rows and columns
- The X/Y coordinate of the first and last position on the tray

The nozzle type:

Type 508

3.4.3 Image Analyzing

Program the dimension of the components reality and components package type. Through the camera image analyze for identifying accurate mounting.

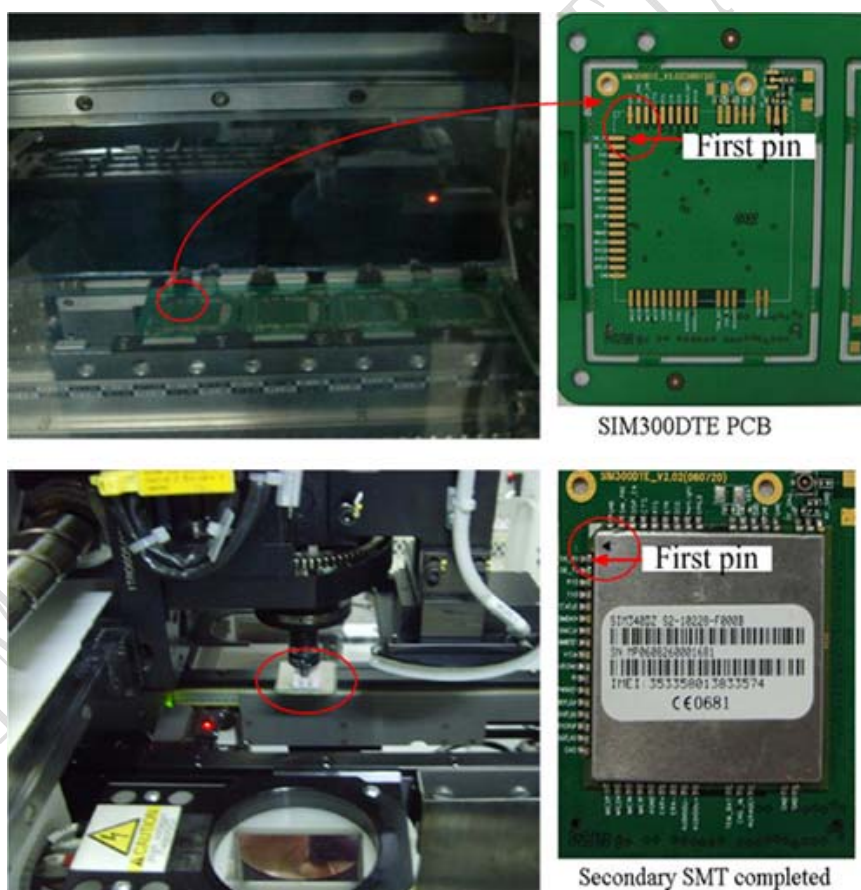


Figure 5: Image analyzing

3.4.4 X/Y Coordinate Calibration

Assemble SIM340D-TE PCB into mounter, use camera to take the photograph to save the mounting coordinate through the PCB.

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3.5 Reflow

3.5.1 Reflow Profile

Please refer to the recommended ramp-soak-spike reflow profile as shown in the following figure.

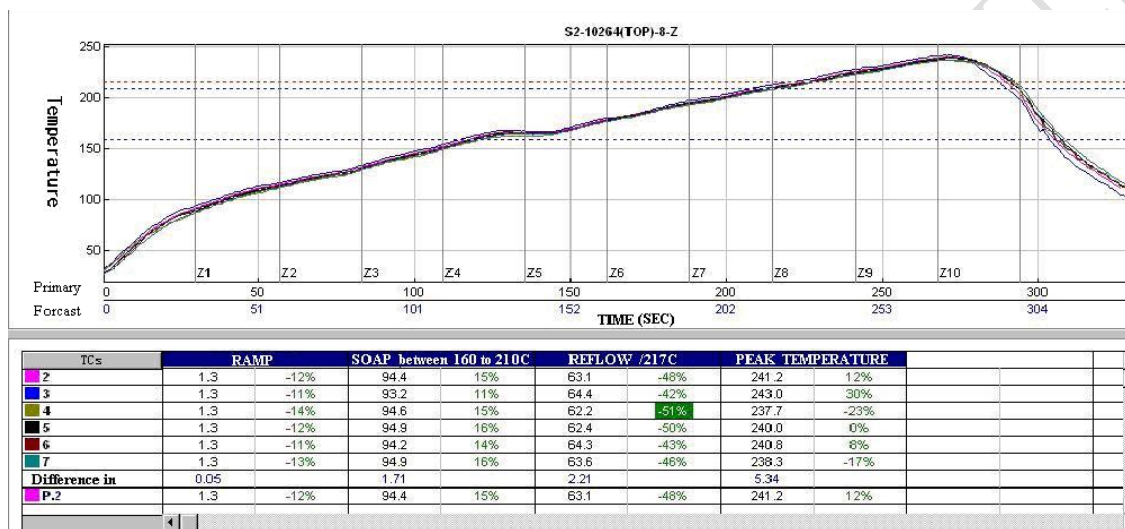


Figure 6: Recommended ramp-soak-spike reflow profile

3.5.2 Reflow Times

For all SMT modules, the reflow time should not be more than 2 after the modules delivered to the customer.

3.6 Inspection Criteria

The appearance of the solder joint surface shall be smooth, nonporous, undisturbed.

Solder shall wet all elements of the connection. And the flank of pads is just for assistance of mounting, solder paste on the flank of pads is not required.

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