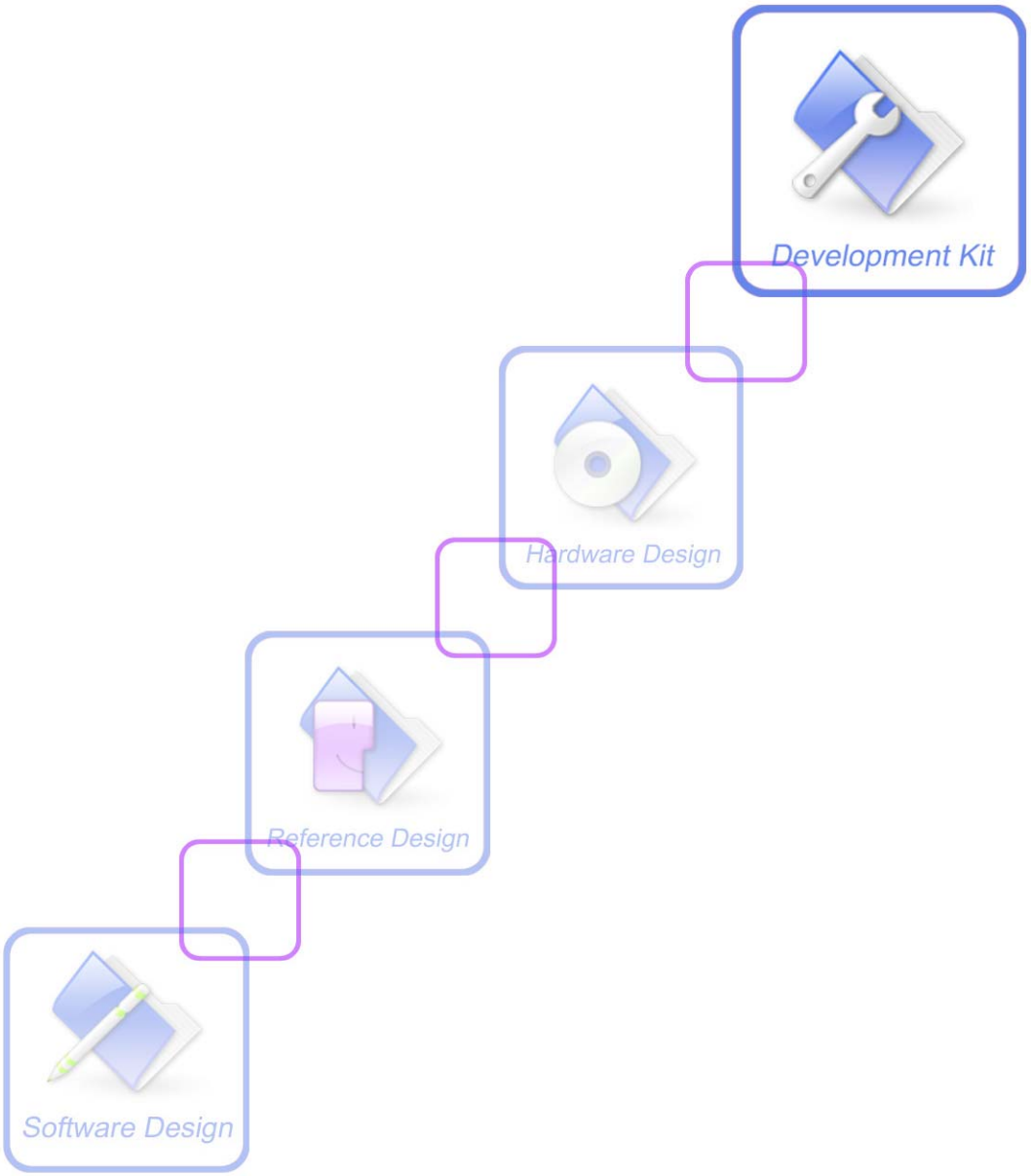
SMT Guidelines

Module Secondary SMT UGD_V1.08



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General Notes

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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

1 Scope of the document

This document applies to all of versions of the SIMCom GSM/GPRS/EDGE/TD-SCDMA/WCDMA /SRD surface mount technology modules.

2 SMT Overview

2.1 Package Types

The modules are all made of SMT types.

2.2 Packing Types

SIMCom provide following packing types:

- Tape Packing
- Reel Packing

2.3Mounter Requirements

Component feeder:
Supported Auto-tray feeder.

Component alignment:
Supported Laser, vision, Laser and vision mix-up alignment

Diameter of nozzle:
5.0mm--10.0mm

2.4Soldering Equipment Requirements

Supported Hot-air soldering

3 SMT Manufacturing Process

This chapter describes the whole process of module secondary SMT manufacturing including solder paste printing, place SMD and preheat/reflow.
The following process is illustrating as the SIM300DTE 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	Moisture Sensitivity Level
SIM300D， SIM340D， SIM500W_V1.01，SIM20	2
The other modules	5

Please pay attention to the floor life in Figure 1.before your secondary soldering process.

Table2 Moisture Classification Level and Floor Life

Level	Floor Life(out of bag)at factory ambient≦30℃/60%RH or as stated
1	Unlimited at ≦30℃/85% 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, must be reflowed within the time limit specified on the label.

NOTES:
If the vacuum package is not open for 3 months or more than the packing date, baking is also recommended before re-flow soldering.

3.2 Moisture-proof Requirement

For SIM700D, 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. The SIM700D should be baked 192 hours at temperature

40℃+5℃/-0℃ and <5% RH for low-temperature device containers, or 72 hours at temperature 80℃±5℃ for high-temperature device containers. Care should be taken for that plastic tray is not heat resistant. SIM700D modules should be taken out for preheating , otherwise the tray maybe 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 module, the thickness of stencil foil and the recommended footprint are also different.The differences are showing on the table2:

Table 3 the different design of stencil foil and pad length of different module

module	thickness of stencil foil (mm)	Pad length（mm）(shows in figure 2)	
		Inside(A)	Outside(B)
SIM700D/SIM300DZseries/SIM300W series/SIM500Wseries /SIM4100D/SIM900D/ SIM802/SIM20	0.25	1	1
SIM900/SIM900A	0.2	0.8	0.8
SIM5213/SIM5214	0.2	1	1

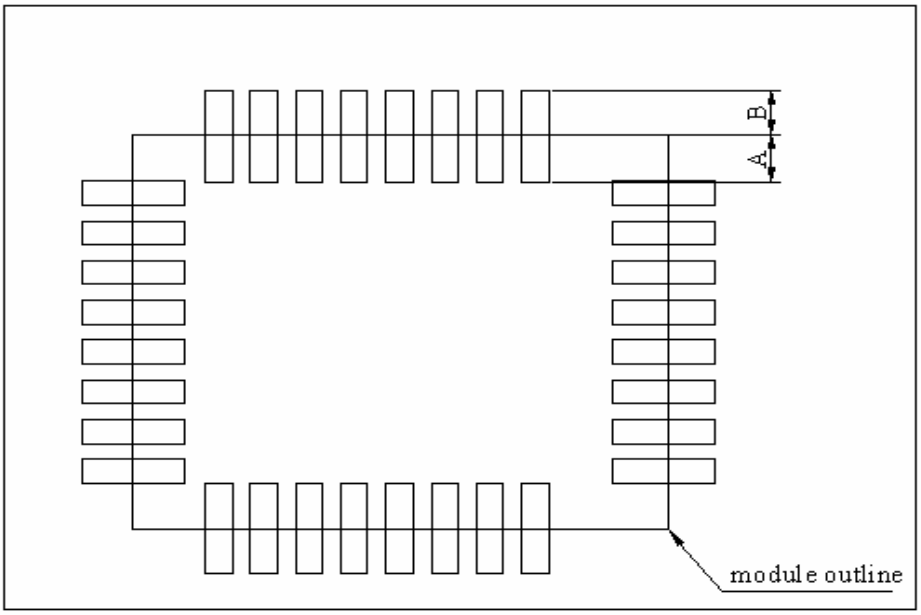


Figure 1: The recommended pad design

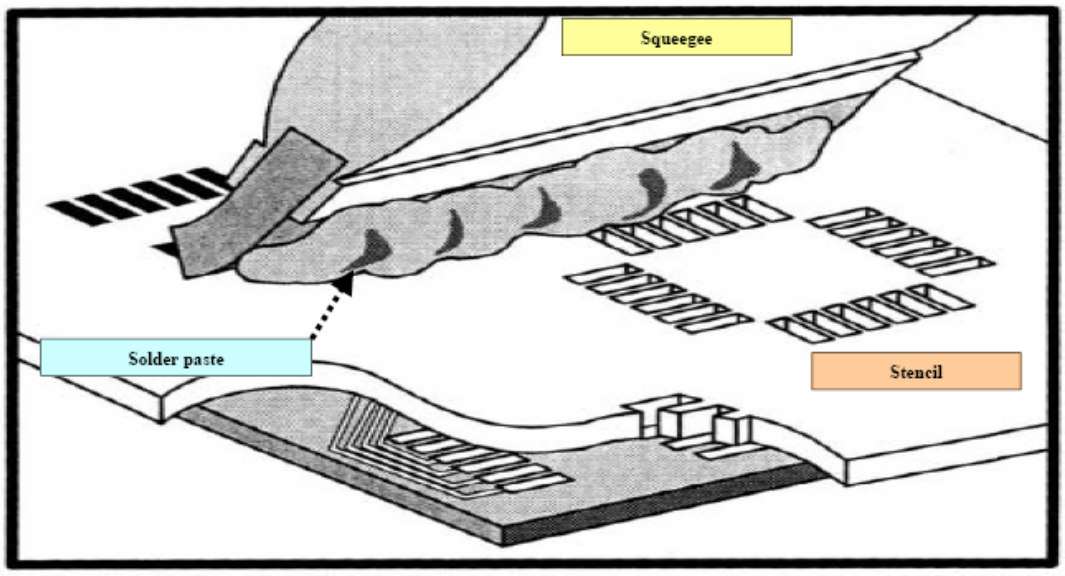


Figure 2: Paste application

3.4 Mounting Process

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

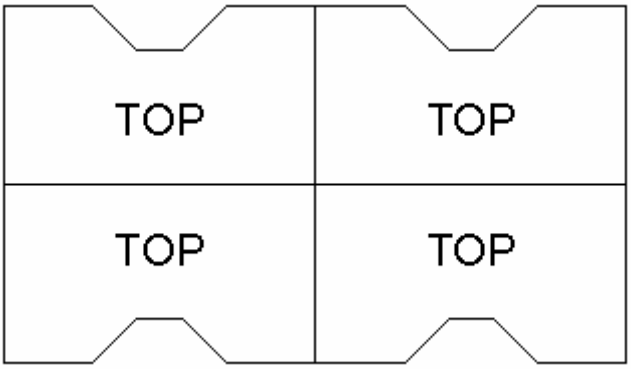


figure 3 multiple printed panel of motherborads

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 analyzing for identifying accurately mounting.

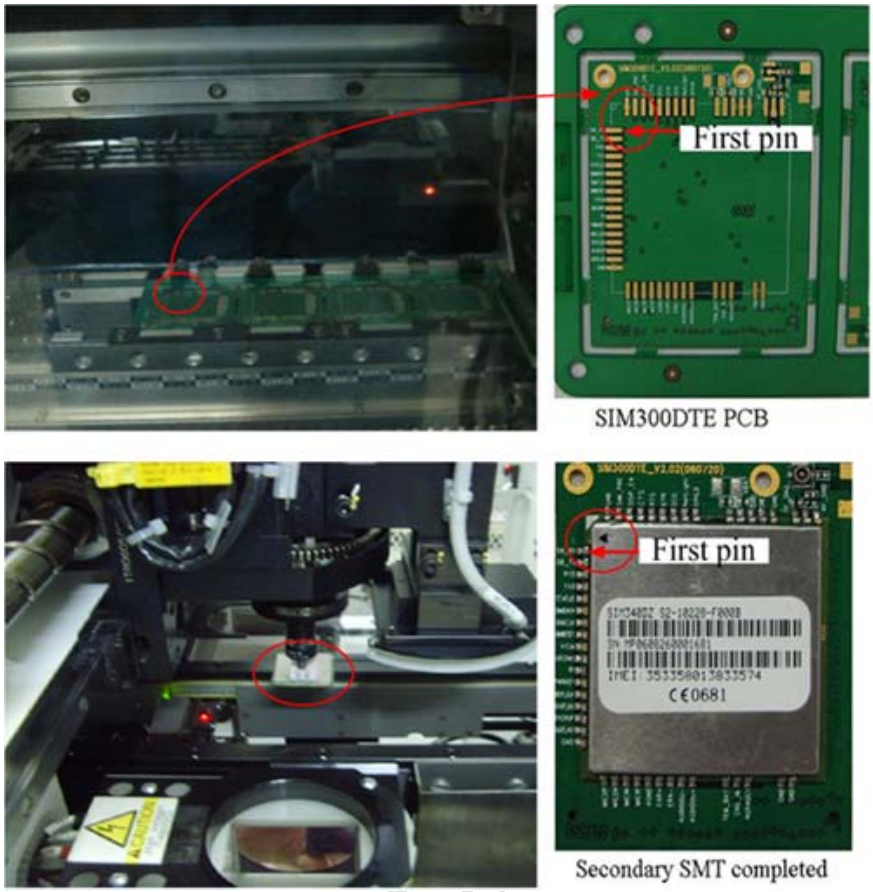


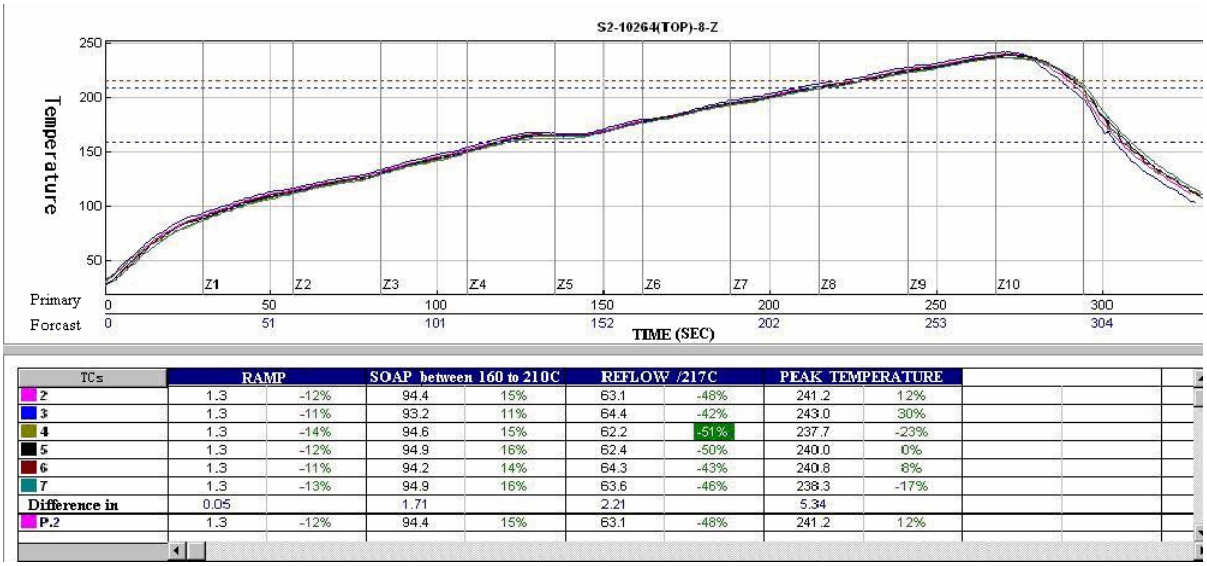
Figure 5: Image analyzing

3.4.4 X/Y Coordinate Calibration

Assemble the SIM340DTE PCB into mounter, through the PCB camera taking the photograph to save the mounting coordinate.

3.5 Reflow

Please refer to the recommended ramp-soak-spike reflow profile as following shows.



TCs	RAMP		SOAP between 160 to 210C		REFLOW /217C		PEAK TEMPERATURE	
2	1.3	-12%	94.4	15%	63.1	-48%	241.2	12%
3	1.3	-11%	93.2	11%	64.4	-42%	243.0	30%
4	1.3	-14%	94.6	15%	62.2	-51%	237.7	-23%
5	1.3	-12%	94.9	16%	62.4	-50%	240.0	0%
6	1.3	-11%	94.2	14%	64.3	-43%	240.8	8%
7	1.3	-13%	94.9	16%	63.6	-46%	238.3	-17%
Difference in	0.05		1.71		2.21		5.34	
P.2	1.3	-12%	94.4	15%	63.1	-48%	241.2	12%

Figure 6: Recommended ramp-soak-spike reflow profile

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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