

# SKW97 Datasheet

## 2x2 MIMO WLAN Module

### Document Information

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V1.03	Update Wireless Features	George He	20180605
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## 1 General Description

The SKW97 module includes an 802.11n MAC and baseband, a 2.4GHz radio and FEM, a 650MHz MIPS CPU, a 5-port 10/100 fast Ethernet switch. Solution for low power, low-cost, and highly integrated AP router and consumer electronic devices, the module requires only an external 3.3V power supply. It supports 802.11n operating up to 144 Mbps for 20 MHz and 300 Mbps for 40 MHz channel respectively, and IEEE 802.11b/g data rates.

The module supports bridge mode and AP Client mode and Gateway mode. The high performance Module can process advanced applications effortlessly, such as routing, security and VoIP. It also includes a selection of interface to support a variety of applications, such as a USB port for accessing external storage and 3G/TLE modem. Especially in the IOT, a wide range of applications.

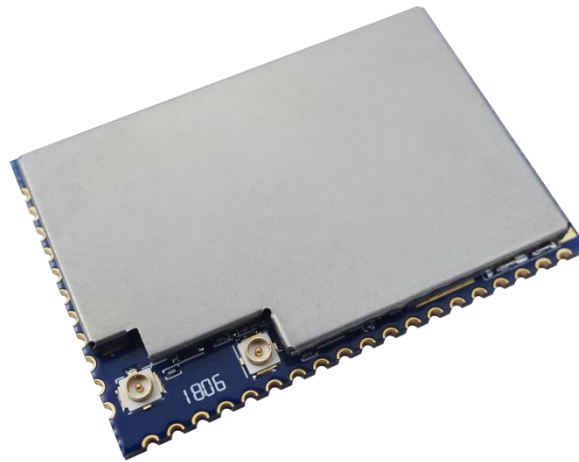


Figure 1: SKW97 Top View

## 2 Applications

- ◆ USB WiFi Camera
- ◆ IOT (internet of things)
- ◆ WiFi AP
- ◆ 3G/4G Wi-Fi Router
- ◆ WiFi Repeater
- ◆ Building Automation
- ◆ Home Automation
- ◆ Smart Home Gateway
- ◆ Industry Control

### 3 Features

- ◆ Compliant to IEEE 802.11b/g/n.
- ◆ 2T2R mode with support for a 300Mbps PHY data rate.
- ◆ DDR2 memory up to 1024Mb.
- ◆ Flash memory up to 256Mb.
- ◆ 4 LAN ports and 1 WAN port.
- ◆ Support USB 2.0 slave device for USB disk and USB 3G/4G dongle and USB camera.
- ◆ Security: WEP64/128, TKIP, AES, WPA, WPA2, WAPI.
- ◆ Support AP/Client/Router mode.
- ◆ ROHS compliance meets environment-friendly requirement.
- ◆ Conform to FCC/CE/IC/ROHS certification standards.
- ◆ 40.5(L) x 27.5(W) x 2.9(H) mm small dimension.

## 4 Application Block Diagram

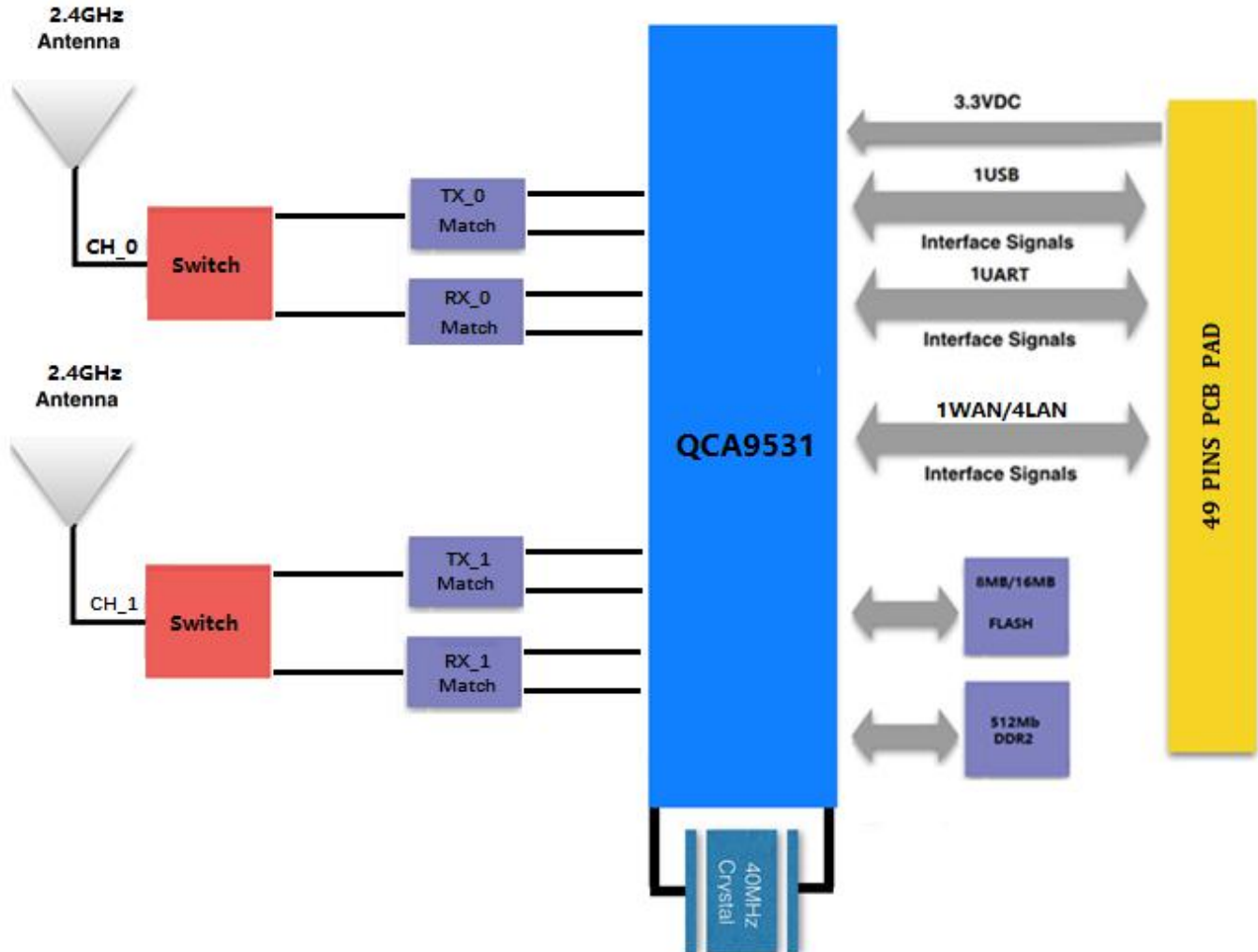


Figure 2: SKW97 Block Diagram

## 5 Interfaces

### USB

The USB interface support USB slave devices for USB disk and USB 3G/4G dongle and USB camera.

### UART

The UART default baud rate is 115200bps.

## GPIO

SKW97 Pin Number	GPIO	Description	Share function
48	GPIO17	JUMPSTART	
8	GPIO4	LED7/WAN LED, do not pull up.	LED
9	GPIO16	LED6/LAN3 LED	
10	GPIO15	LED5/LAN2 LED	
11	GPIO14	LED4/LAN1 LED	
12	GPIO13	LED1/SYSTEM LED	
14	GPIO11	LED3/LAN0_LED	
15	GPIO12	LED0/Wireless LED	

## WAN/LAN

The SKW97 module integrates 5-port 10/100Mbps fast Ethernet switch.

## 6 Module Specifications

Hardware Features	
Model	SKW97
Antenna Type	IPEX
Chipset solution	
Voltage	3.3V±5%
Dimension(L×W×H)	40.5mm*27.5mm*2.9mm
Wireless Features	
Wireless Standards	IEEE 802.11b/g/n
Frequency Range	2412GHz--2484MHz
Data Rates	IEEE 802.11b : 1,2,5.5,11Mbps
	IEEE 802.11g : 6,9,12,18,24,36,48,54Mbps
	IEEE 802.11n : MCS0--MCS7 @ HT20
	MCS0--MCS7 @ HT40
Receiver Sensitivity	HT40 MCS7 : -72dBm@10% PER(MCS7)
	HT20 MCS7 : -74dBm@10% PER(MCS7)

	54M: -77dBm@10% PER
	11M: -88dBm@ 8% PER
Modulation Technique	DSSS (DBPSK, DQPSK, CCK)
	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
Wireless Security	WPA/WPA2, WEP, TKIP and AES, WPS2.0, WAPI
Transmit Power	IEEE 802.11n: 13dBm @HT20/40 MCS7
	IEEE 802.11g: 15dBm @54MHz
	IEEE 802.11b: 18dBm @11MHz
Work Mode	Bridge/Gateway/AP Client
<b>Others</b>	
Certification	ROHS
Environment	Operating Temperature: 0°C~70°C
	Storage Temperature: -40°C~125°C
	Operating Humidity: 10%~90% non-condensing
	Storage Humidity: 5%~90% non-condensing



## 7 Module Pinout and Pin Description

### Module Pinout

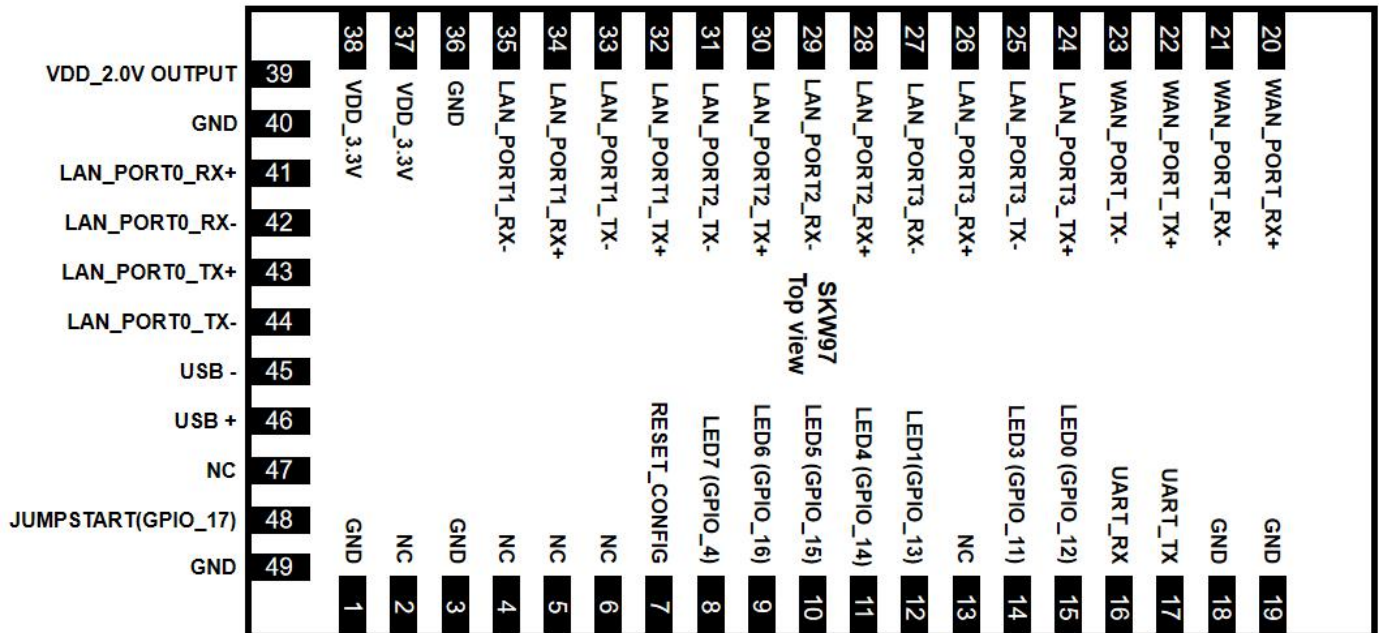


Figure 3: SKW97 Pin Package

### Pin Description

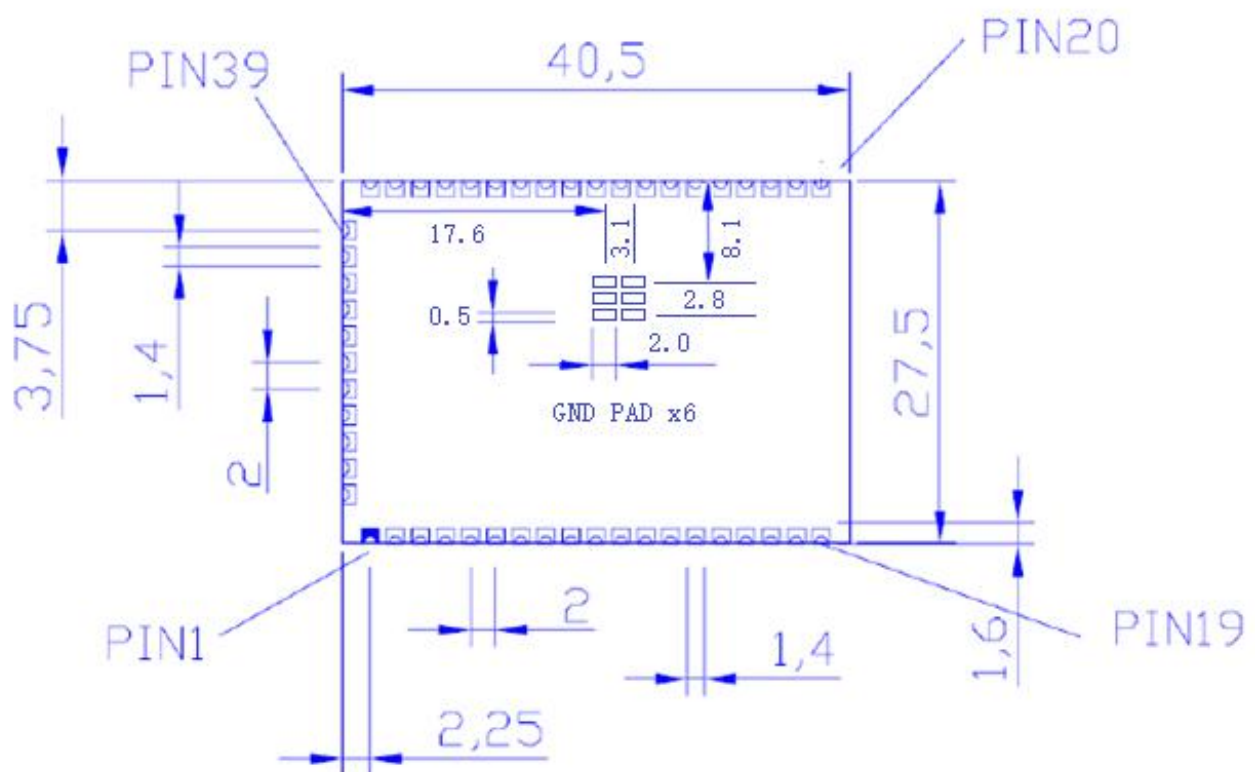
Pin No.	Pin name	Description
1	GND	GROUND
2	NC	NC
3	GND	GROUND
4	NC	NC
5	NC	NC
6	NC	NC
7	RESET_CONFIG	resets the firmware to its default configuration. Active pulling down.
8	LED7 (GPIO_4)	WAN LED, do not pull up.
9	LED6 (GPIO_16)	LAN_PORT3_LED.
10	LED5 (GPIO_15)	LAN_PORT2_LED
11	LED4 (GPIO_14)	LAN_PORT1_LED
12	LED1(GPIO_13)	SYSTEM LED

13	NC	NC
14	LED3 (GPIO_11)	LAN_PORT0_LED
15	LED0 (GPIO_12)	Wireless LED
16	UART_RX	Serial data in
17	UART_TX	Serial data out
18	GND	GROUND
19	GND	GROUND
20	WAN_PORT_RX+	WAN port
21	WAN_PORT_RX-	WAN port
22	WAN_PORT_TX+	WAN port
23	WAN_PORT_TX-	WAN port
24	LAN_PORT3_TX+	Ethernet port3
25	LAN_PORT3_TX-	Ethernet port3
26	LAN_PORT3_RX+	Ethernet port3
27	LAN_PORT3_RX-	Ethernet port3
28	LAN_PORT2_RX+	Ethernet port2
29	LAN_PORT2_RX-	Ethernet port2
30	LAN_PORT2_TX+	Ethernet port2
31	LAN_PORT2_TX-	Ethernet port2
32	LAN_PORT1_TX+	Ethernet port1
33	LAN_PORT1_TX-	Ethernet port1
34	LAN_PORT1_RX+	Ethernet port1
35	LAN_PORT1_RX-	Ethernet port1
36	GND	GROUND
37	VDD_3.3V	3.3V input 1000mA, recommended voltage 3.3V, Min3.14V, MAX 3.46V
38	VDD_3.3V	3.3V input 1000mA, recommended voltage 3.3V, Min3.14V, MAX 3.46V
39	VDD_2.0V OUTPUT	Power supply output for peripheral network transformer
40	GND	GROUND

41	LAN_PORT0_RX+	Ethernet port0
42	LAN_PORT0_RX-	Ethernet port0
43	LAN_PORT0_TX+	Ethernet port0
44	LAN_PORT0_TX-	Ethernet port0
45	USB -	USB signal, carries USB data to and from the USB 2.0 PHY
46	USB +	USB signal, carries USB data to and from the USB 2.0 PHY
47	NC	NC
48	JUMPSTART(GPIO_17)	KEY_INPUT to start WPS function. Active pulling down.
49	GND	GROUND

**WARNING: GPIO4 do not pull up.**

## 8 PCB Footprint and Dimensions



**Figure 4: SKW97 Recommend PCB Footprint**

## 9 Electrical Characteristics

### a) Absolute Maximum Ratings

Table9-1: Absolute Maximum Ratings

Parameter	Condition	Min	Typ.	Max.	Unit
Storage temperature range		-40		125	°C
ESD Protection	VESD	/		2000	V
Supply voltage	VDD_3.3V	0		3.6	V
Voltage on any I/O pin		-0.3		3.63	V

SKW97 series modules are Electrostatic Sensitive Devices and require special precautions while handling.



#### ESD precautions

The SKW97 module contain highly sensitive electronic circuitry and are Electrostatic Sensitive Devices (ESD).

Handling the SKW97 module without proper ESD protection may destroy or damage them permanently.

The SKW97 module are electrostatic sensitive devices (ESD) and require special ESD precautions typically applied to ESD sensitive components. Proper ESD handling and packaging procedures must be applied throughout the processing, handling, transportation and operation of any application that incorporates the SKW97 module. Don't touch the module by hand or solder with non-anti-static soldering iron to avoid damage to the module.

### b) Recommended Operation Ratings

Table9-2: Operating Conditions

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Extended temp. range	TA	0		70	°C
Power Supply	VDD_3.3V	3.14	3.3	3.46	V
Input Low Voltage	VIL	-0.3		0.8	V
Input High Voltage	VIH	2		3.63	V

### c) Measurement Conditions

Table9-3: Power Consumption in Different States

System state	Current (Typ.)@3.3V	Current (Max.)@3.3V
Standby	180 mA	210 mA
Transmit (2.4g; +15 dBm @ TX HT20 MCS7.)	400 mA	
Transmit (2.4g; +18 dBm @ 11b 11Mbps.)	580 mA	685 mA

## 10 Manufacturing Process Recommendations

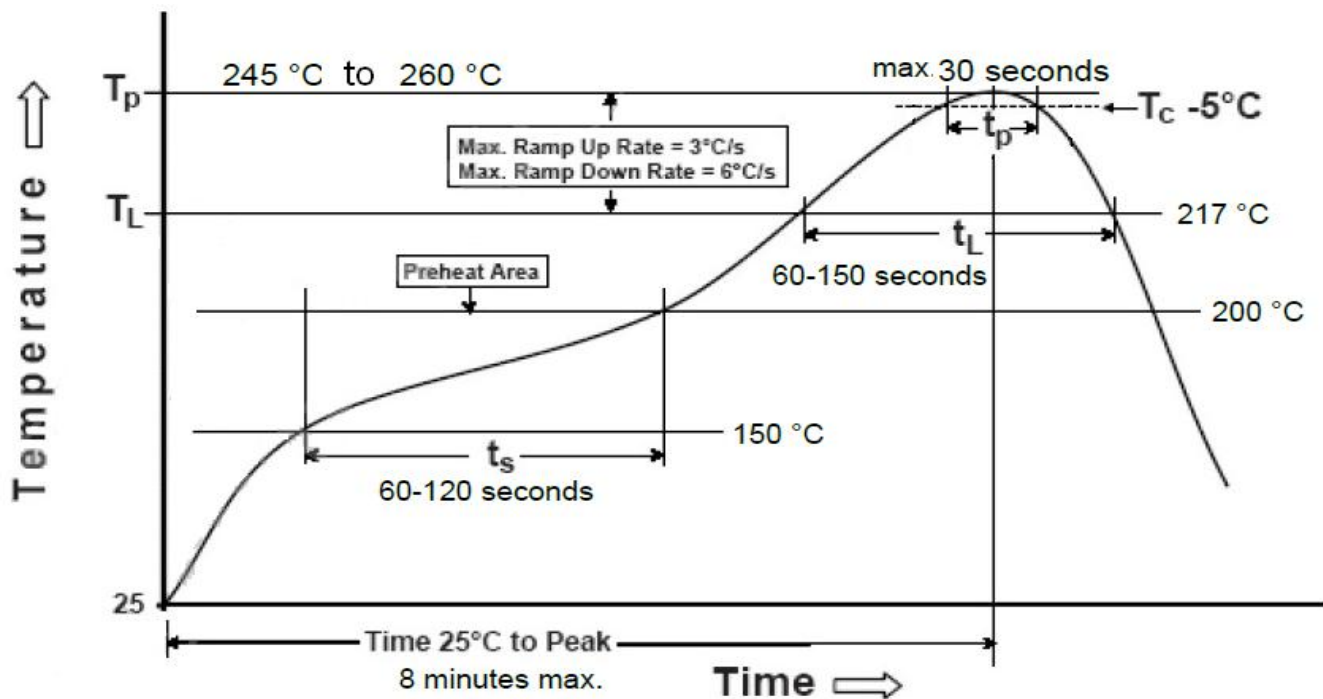
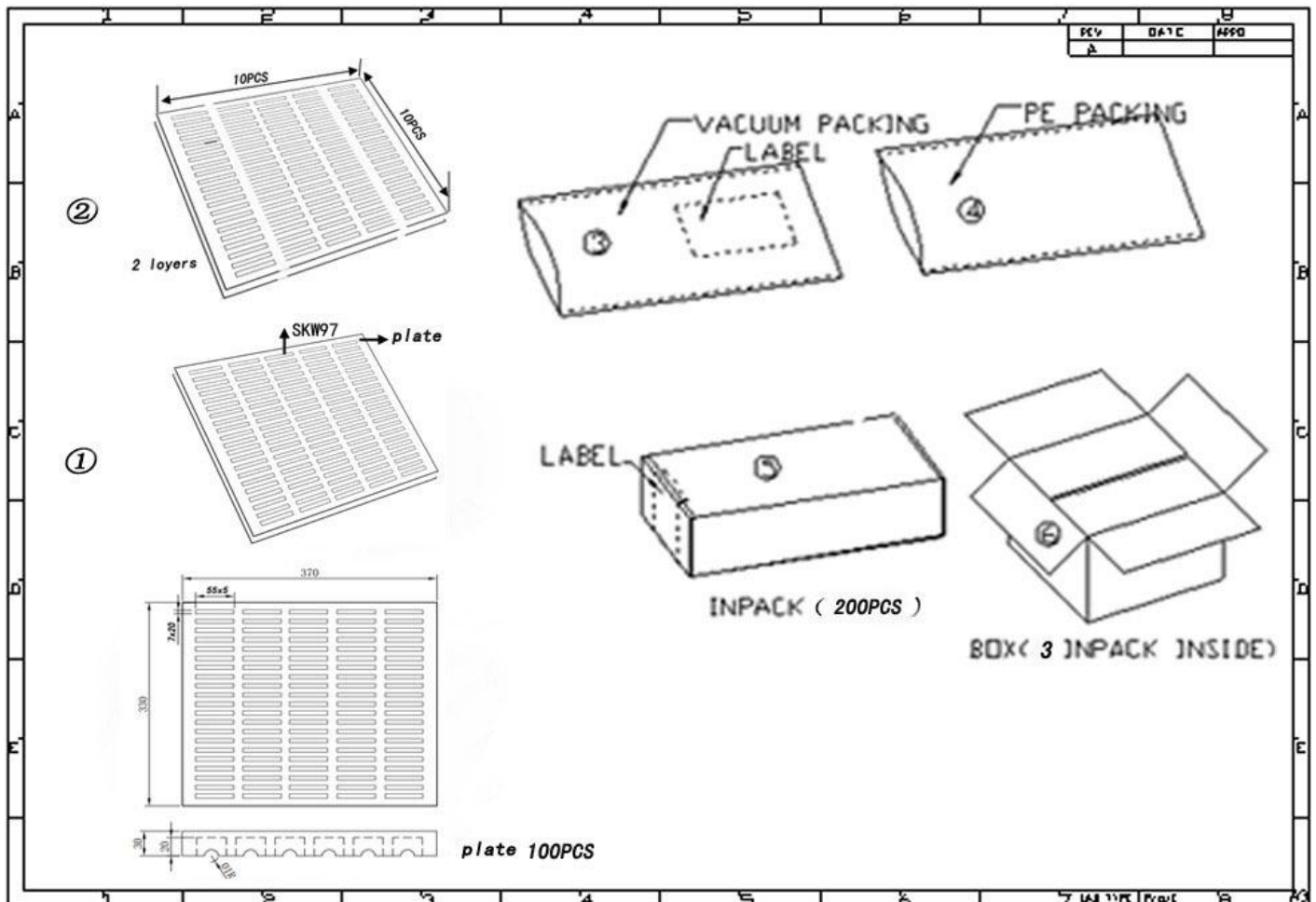


Figure 5: SKW97 Typical Lead-free Soldering Profile

**Note:** The final soldering temperature chosen at the factory depends on additional external factors like choice of soldering paste, size, thickness and properties of the baseboard, etc. Exceeding the maximum soldering temperature in the recommended soldering profile may permanently damage the module.

## 11 Packaging Specification



## 12 Ordering Information

Module No.	SPI Flash Size	DDR2 Size
SKW97_E85	8M Bytes	512M bites
SKW97_E81	8M Bytes	1024M bites
SKW97_E165	16M Bytes	512M bites
SKW97_E161	16M Bytes	1024M bites
SKW97_E325	32M Bytes	512M bites
SKW97_E321	32M Bytes	1024M bites

## 13 Contact Information

**Skylab M&C Technology Co., Ltd.**

深圳市天工测控技术有限公司

**Address:** 6 Floor, No.9 Building, Lijincheng Scientific & Technical park, Gongye East Road,

Longhua District, Shenzhen, Guangdong, China

**Phone:** 86-755 8340 8210 (Sales Support)

**Phone:** 86-755 8340 8510 (Technical Support)

**Fax:** 86-755-8340 8560

**E-Mail:** [technicalsupport@skylab.com.cn](mailto:technicalsupport@skylab.com.cn)

**Website:** [www.skylab.com.cn](http://www.skylab.com.cn)     [www.skylabmodule.com](http://www.skylabmodule.com)