

SKW99 2x2 MIMO WLAN Module Datasheet

Document Information

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1 General Description

The SKW99 module includes an 802.11n MAC and baseband, a 2.4GHz radio and FEM, a 650MHz MIPS CPU, a 2-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.

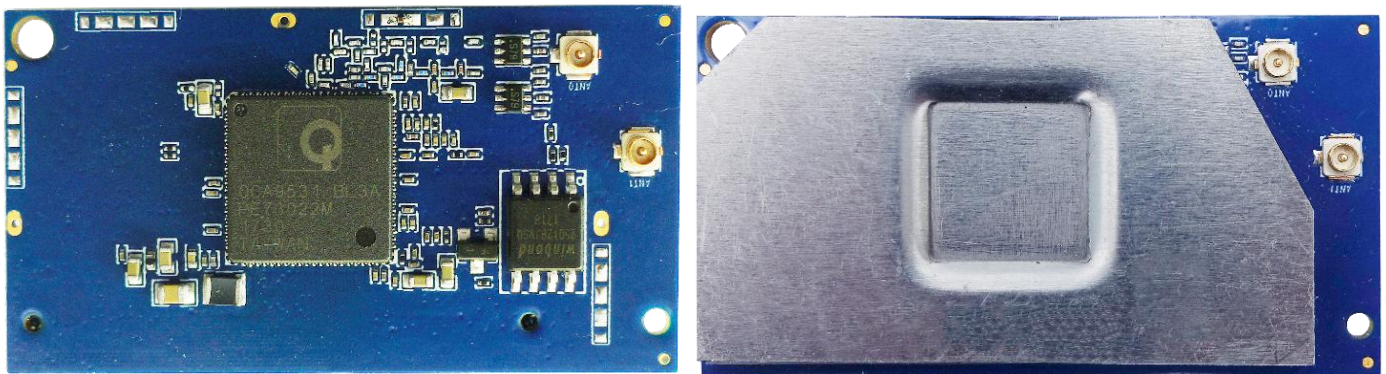


Figure 1: SKW99 Top View

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
- ◆ 48.4(L) x 25.7(W) x 9.0(H) mm small dimension

4 Application Block Diagram

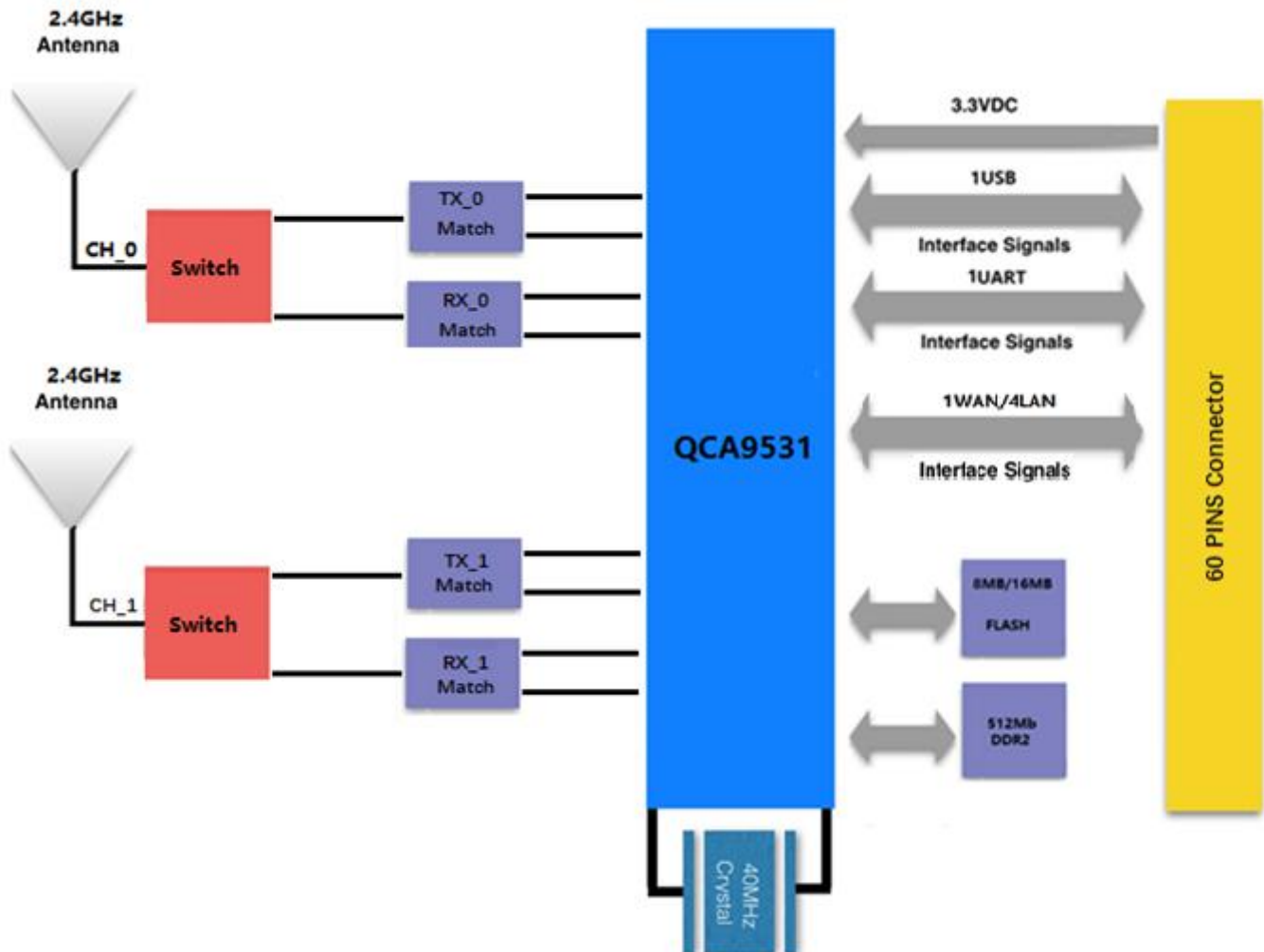


Figure 2: SKW99 Block Diagram

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

SKW99 Pin Number	GPIO	Description	Share function
24	GPIO0	GPIO0	
26	GPIO1	GPIO1	
28	GPIO2	GPIO2	
44		RESET_CONFIG	
46	GPIO17	JUMPSTART	
54	GPIO4	LED7/WAN LED, do not pull up.	LED
53	GPIO16	LED6/LAN1 LED	
8	GPIO15	LED5/LAN2 LED	
6	GPIO14	LED4/LAN3 LED	
40	GPIO13	LED1/SYSTEM LED	
4	GPIO11	LED3/LAN4_LED	
55	GPIO12	LED0/Wireless LED	

WAN/LAN

The SKW99 module integrates 5-port 10/100Mbps fast Ethernet switch.

6 Module Specifications

Hardware Features	
Model	SKW99
Antenna Type	IPEX
Chipset solution	
Voltage	3.3V±5%
Dimension(L×W×H)	48.4mm*25.8mm*9.0mm
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 : -69dBm@10% PER(MCS7)
	HT20 MCS7 : -71dBm@10% PER(MCS7)
	54M: -75dBm@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: 13-16dBm @HT20/40 MCS7
	IEEE 802.11g: 14-17dBm @54MHz
	IEEE 802.11b: 16-20dBm @11MHz
Work Mode	Bridge/Gateway/AP Client
Others	
Certification	RoHS
Environment	Operating Temperature: -20°C~70°C
	Storage Temperature: -40°C~85°C
	Operating Humidity: 10%~90% non-condensing
	Storage Humidity: 5%~90% non-condensing

7 Module Pinout and Pin Description

Module Pinout

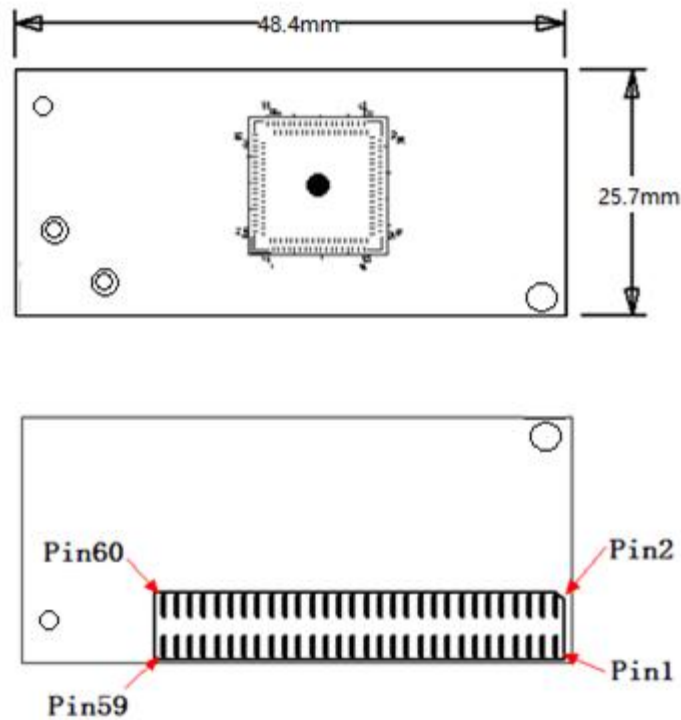


Figure 3: SKW99 Pin Package

Pin Description

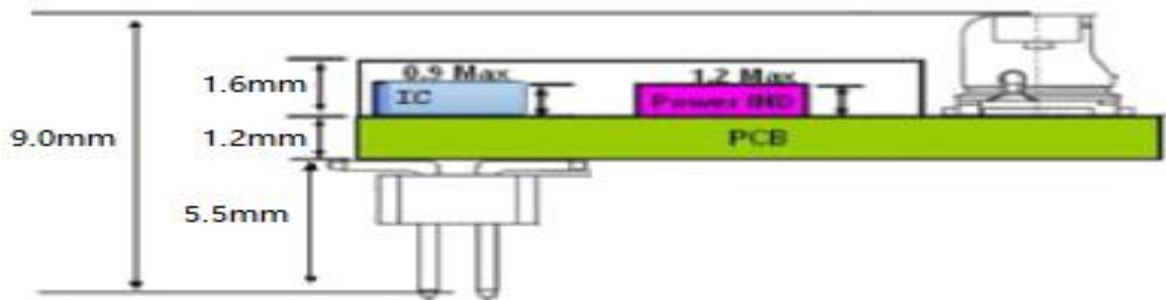
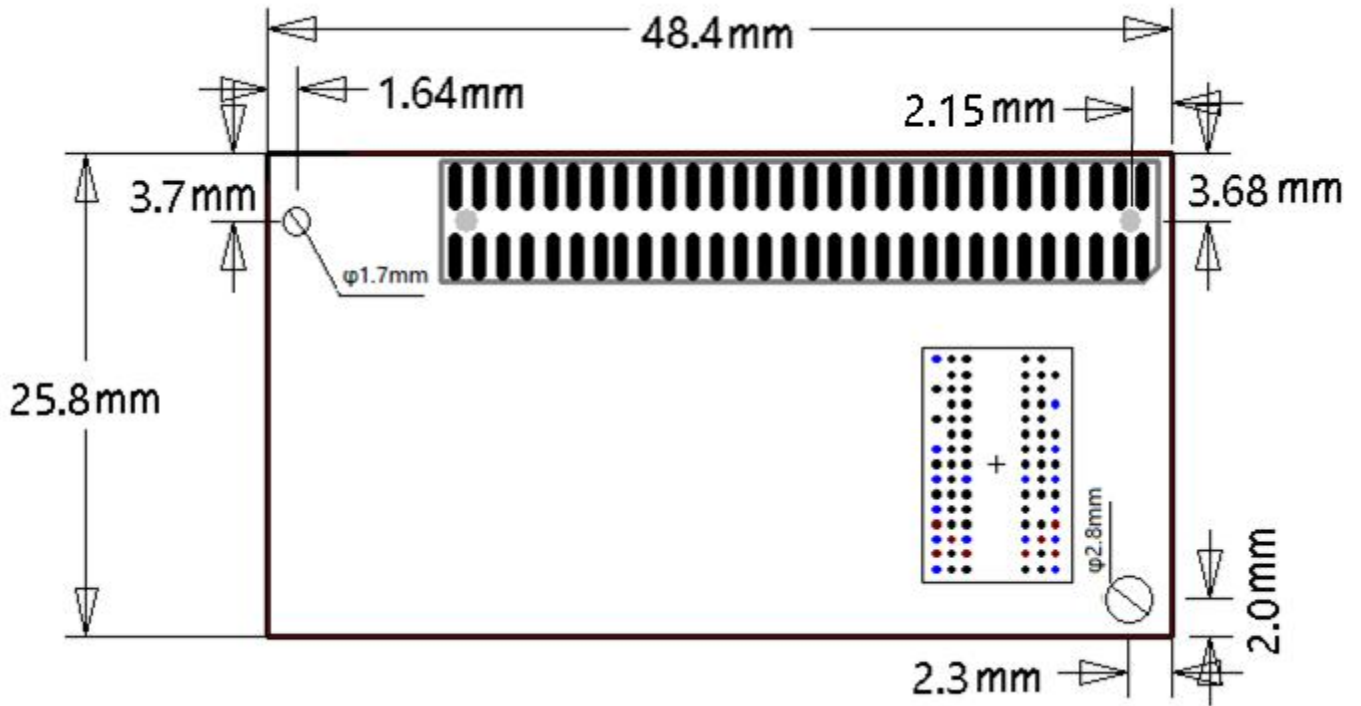
Pin No.	Pin name	Description
1	GND	Groud
2	GND	Groud
3	LAN_PORT3_RX+	Ethernet port
4	LED_LINK4	Port #3 activity LED, GPIO#11
5	LAN_PORT3_RX-	Ethernet port
6	LED_LINK3	Port #2 activity LED, GPIO#14
7	LAN_PORT3_TX+	Ethernet port
8	LED_LINK2	Port #1 activity LED, GPIO#15
9	LAN_PORT3_TX-	Ethernet port
10	GND	Groud

11	GND	Ground
12	LAN_PORT1_TX-	Ethernet port
13	LAN_PORT2_TX+	Ethernet port
14	LAN_PORT1_TX+	Ethernet port
15	LAN_PORT2_TX-	Ethernet port
16	LAN_PORT1_RX+	Ethernet port
17	LAN_PORT2_RX+	Ethernet port
18	LAN_PORT1_RX-	Ethernet port
19	LAN_PORT2_RX-	Ethernet port
20	VDD_3.3V	3.3V input 1000mA, recommended voltage 3.3V, Min2.97V, MAX
21	GND	Ground
22	VDD_3.3V	3.3V input 1000mA, recommended voltage 3.3V, Min2.97V, MAX 3.63V
23	WAN_PORT4_RX+	Ethernet Wan port
24	GPIO_0	GPIO#0
25	WAN_PORT4_RX-	Ethernet Wan port
26	GPIO_1	GPIO#1
27	WAN_PORT4_TX+	Ethernet Wan port
28	GPIO_2	GPIO#2
29	WAN_PORT4_TX-	Ethernet Wan port
30	NC	No Connect
31	LAN_PORT0_RX+	Ethernet port
32	NC	NC
33	LAN_PORT0_RX-	Ethernet port
34	NC	NC
35	LAN_PORT0_TX+	Ethernet port
36	USB +	USB signal, carries USB data to and from the USB 2.0 PHY
37	LAN_PORT0_TX-	Ethernet port
38	USB -	USB signal, carries USB data to and from the USB 2.0 PHY
39	GND	Ground

40	SYSTEM_LED	System LED, GPIO#13
41	VDD_2.0V OUTPUT	Power supply output for peripheral network transformer
42	VDD_2.5V OUTPUT	GPIO voltage output for LED
43	VDD_2.0V OUTPUT	Power supply output for peripheral network transformer
44	RESET	it has a internal 10k pull-up resistance, and trigger while Pulling down
45	GND	Ground
46	JUMPSTART (GPIO_17)	Resets the firmware to its default configuration, KEY_INPUT to start WPS function, it has a internal 10k pull-up resistance, and
47	SPI_MISO	SPI serial interface
48	GND	Ground
49	SPI_CLK	SPI serial interface
50	VDD_3.3V	3.3V input 1000mA, recommended voltage 3.3V,Min2.97V, MAX 3.63V
51	SPI_MOSI	SPI serial interface
52	VDD_3.3V	3.3V input 1000mA, recommended voltage 3.3V, Min2.97V, MAX 3.63V
53	LED_LINK1	Port #0 activity LED, GPIO#16
54	LED_WAN	WAN LED, GPIO#4, do not pull up to VDD_3V3
55	WLAN_LED	Wireless LED, GPIO#12
56	NC	No Connect
57	UART_TX	Serial data out, GPIO#10
58	UART_RX	Serial data in, GPIO#9
59	GND	Ground
60	GND	Ground

WARNING: **GPIO4 do not pull up to VDD_3V3.**

8 PCB Footprint and Dimensions



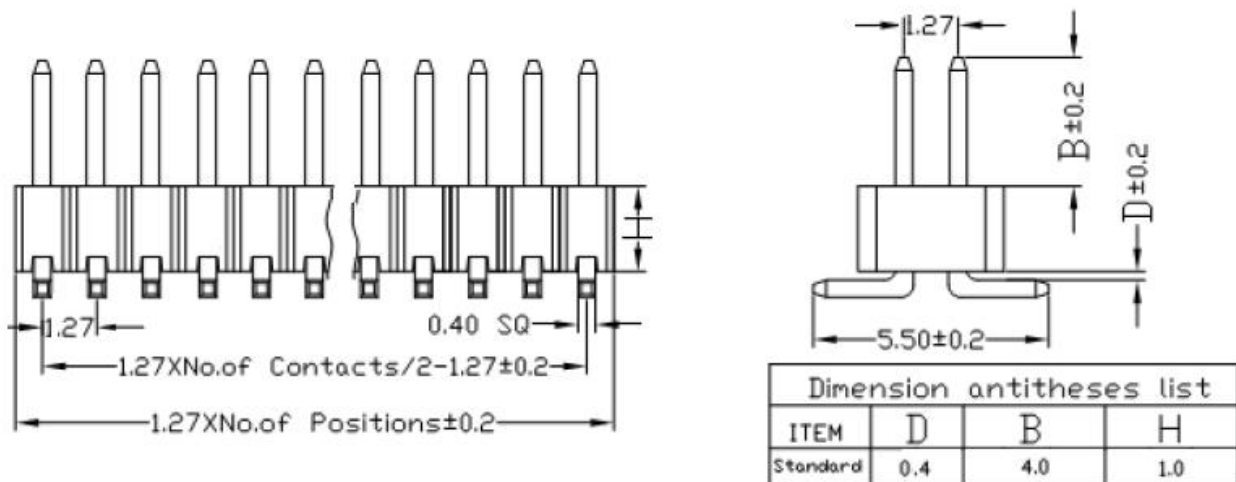


Figure 4: SKW99 Recommend PCB Footprint

9 Electrical Characteristics

a) 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

Table9-1: Absolute Maximum Ratings

SKW99 series modules are Electrostatic Sensitive Devices and require special precautions while handling.



ESD precautions

The SKW99 module contain highly sensitive electronic circuitry and are Electrostatic Sensitive Devices (ESD). Handling the SKW99 module without proper ESD protection may destroy or damage them permanently.

The SKW99 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 SKW99 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

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Extended temp. range	TA	-20		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

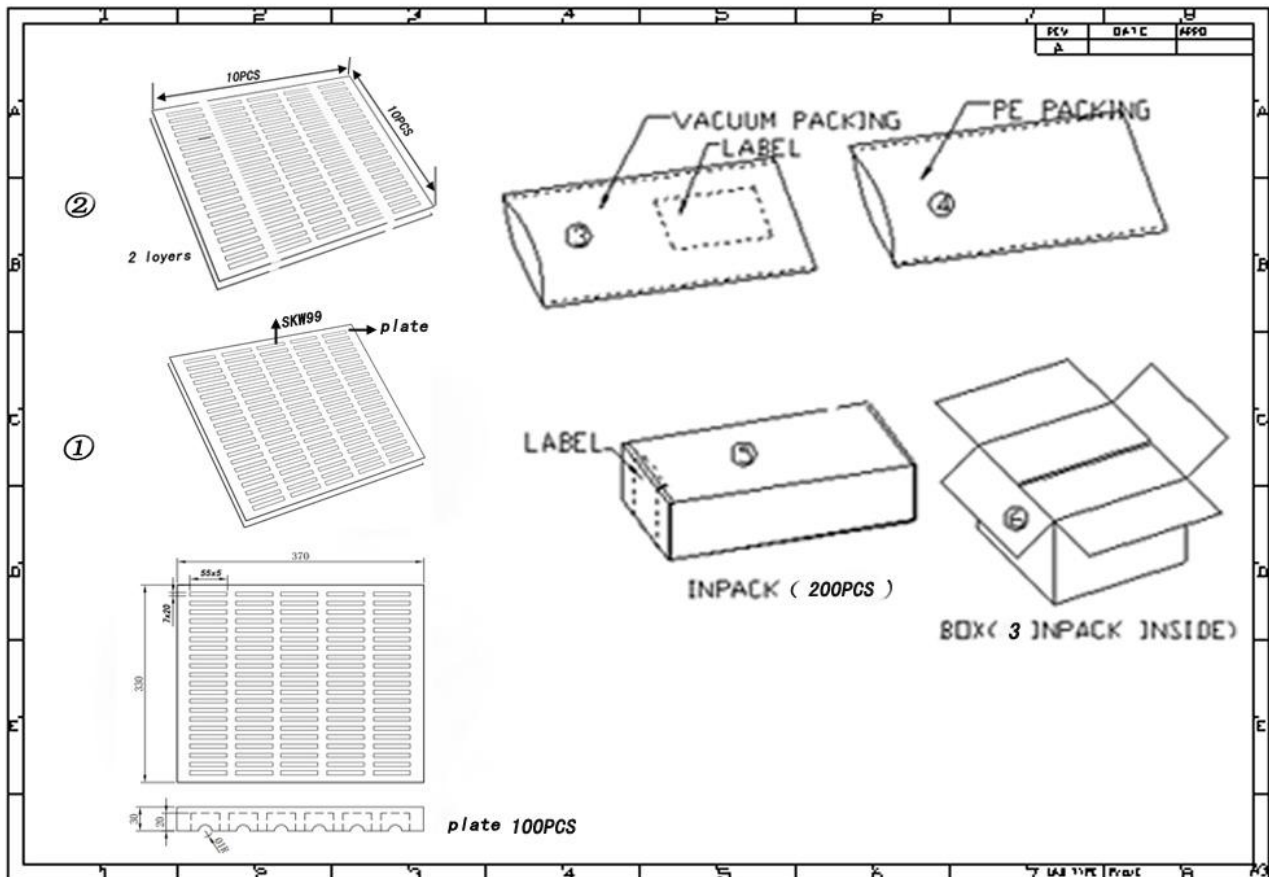
Table9-2: Operating Conditions

c) Measurement Conditions

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

Table9-3: Power Consumption in Different States

10 Packaging Specification



11 Ordering Information

Module No.	SPI Flash Size	DDR2 Size
SKW99_E85	8M Bytes	512M bites
SKW99_E81	8M Bytes	1024M bites
SKW99_E165	16M Bytes	512M bites
SKW99_E161	16M Bytes	1024M bites
SKW99_E325	32M Bytes	512M bites
SKW99_E321	32M Bytes	1024M bites

12 Revision history

Revision	Description	Approved	Date
V1.01	Initial Release	George He	20180130
V1.02	Update Packaging	George He	20180410
V1.03	Update Dimension	George He	20180411
V1.04	Update Dimension	George He	20180413
V1.05	Update Wireless Features	George He	20180605
V1.06	Update Pin Description	George He	20180930
V1.07	Update Pin Description	George He	20200927

13 Contact Information

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