

SKW100 Datasheet

3x3 MIMO WLAN Module

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1 General Description

The SKW100 module compliant to 802.11 a/b/g/n/ac Wi-Fi Solution, It integrates a dual-core MIPS CPU (650MHz), 5-port 10/100 fast Ethernet switch, USB2.0, UART. The module is suitable for 802.11ac, LTE cat4/5, edge, hot-spot, VPN, AC (Access Control). For consumer electronic devices, the module requiring only a external 3.3V power supply .

The module integrates a 2.4GHz 2x2 MIMO WLAN chip with internal PA and LNA and integrates a 5GHz 1x1 WLAN chip with internal PA and LNA. It supports 2.4GHz operations up to 144 Mbps for 20 MHz and 300 Mbps for 40 MHz channel respectively, and supports 5GHz operations up to 433 Mbps for 80 MHz channel respectively.

The module support AP mode and client mode and router mode.

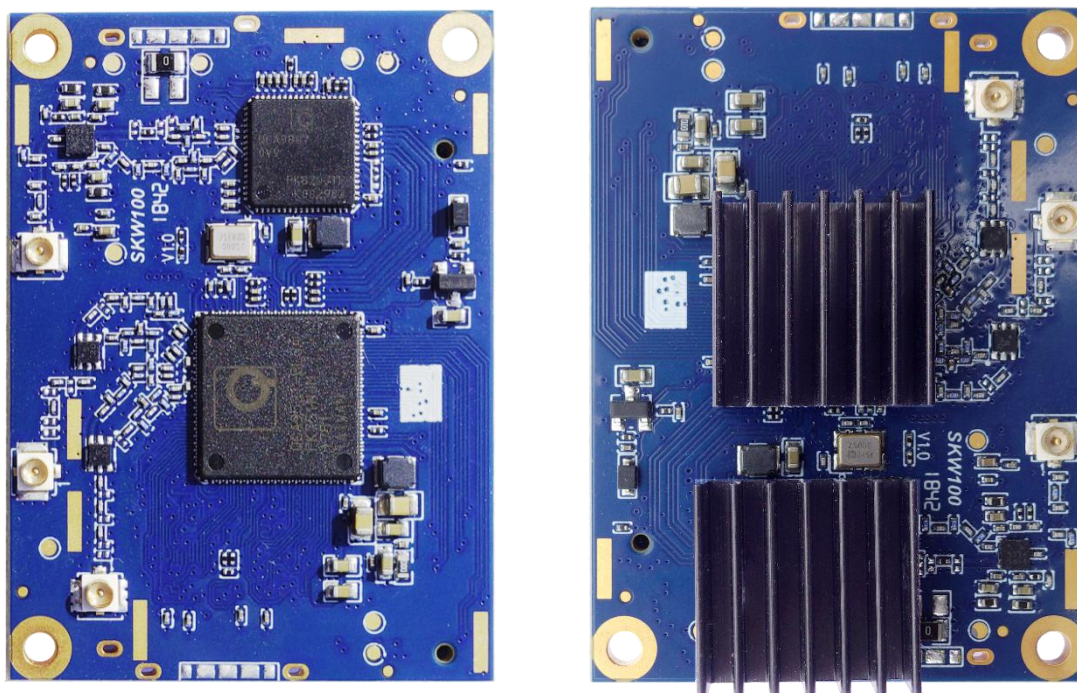


Figure 1: SKW100 Top View

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/ac
- ◆ 3T3R mode with support for a 733Mbps PHY data rate
- ◆ DDR2 memory up to 2048Mb
- ◆ Flash memory up to 512Mb
- ◆ 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
- ◆ 47.8(L) x 35.4(W) x 9.5(H) mm small dimension

4 Application Block Diagram

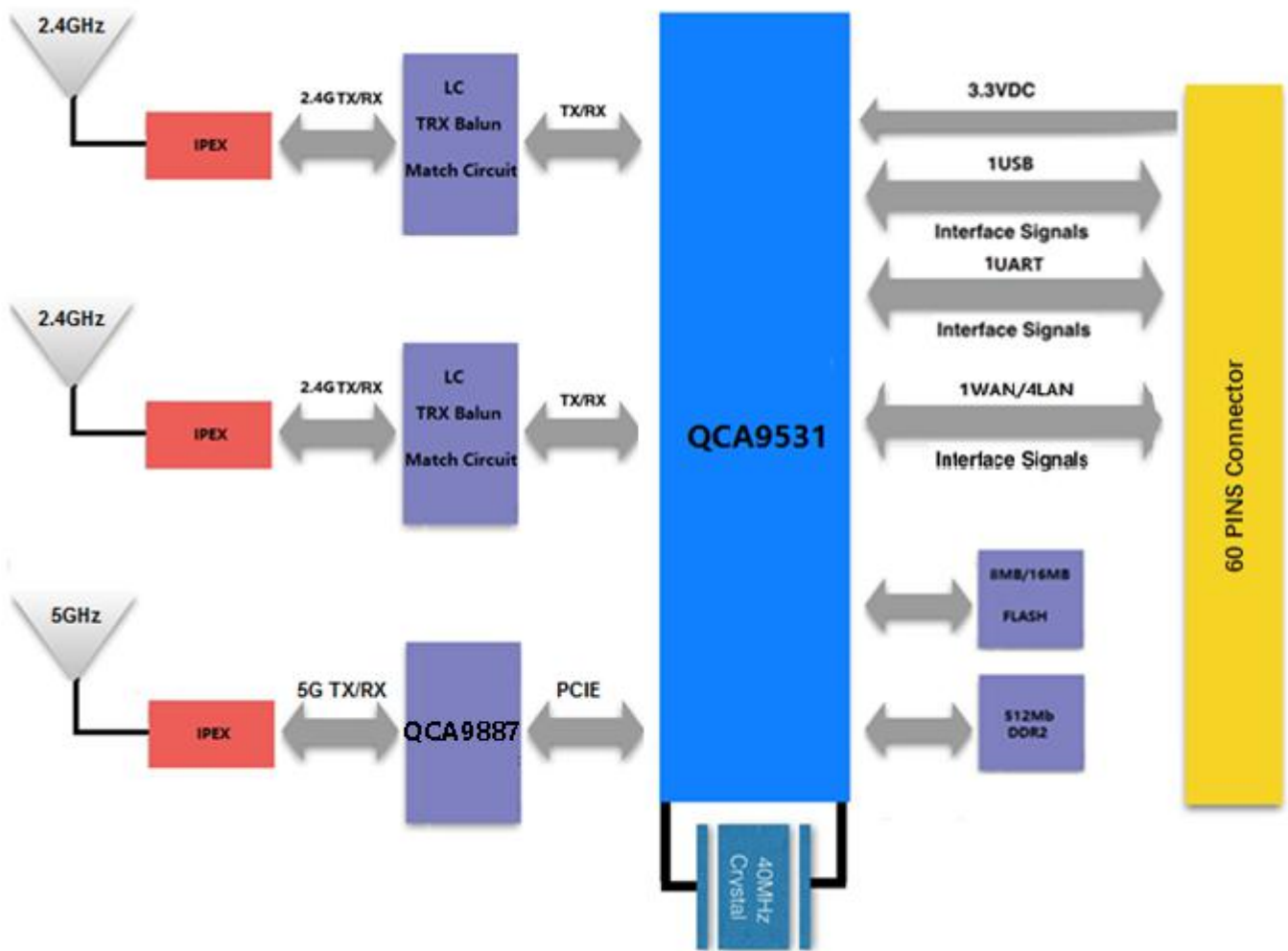


Figure 2: SKW100 Block Diagram

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

SKW100 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 SKW100 module integrates 5-port 10/100Mbps fast Ethernet switch.

6 Module Specifications

Hardware Features	
Model	SKW100
Antenna Type	IPEX
Chipset solution	
Voltage	3.3V±5%
Dimension(L×W×H)	47.8x 35.4 x 9.5mm
Wireless Features	
Wireless Standards	IEEE 802.11a/b/g/n/ac
Frequency Range	2412GHz---2484MHz & 5180---5825MHz
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 /2.4GHz band
	MCS0--MCS7 @ HT40 /2.4GHz band
	MCS0--MCS9 @ HT40 /5GHz band
	IEEE 802.11ac : MCS0--MCS9 @ VHT80 /5GHz band
Receiver Sensitivity	VHT80 MCS9 : -58dBm@10% PER(MCS9) /5GHz band
	HT40 MCS9 : -63dBm@10% PER(MCS9) /5GHz band
	HT40 MCS7 : -70dBm@10% PER(MCS7) /2.4GHz band
	HT20 MCS7 : -71dBm@10% PER(MCS7) /2.4GHz band
	54M: -76dBm@10% PER
	11M: -88dBm@ 8% PER
Modulation Technique	DSSS (DBPSK, DQPSK, CCK)
	OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 125-QAM, 256-QAM)
Wireless Security	WPA/WPA2, WEP, TKIP and AES, WPS2.0, WAPI
Transmit Power	IEEE 802.11ac: 12±2dBm @HT80 MCS9 /5GHz band
	IEEE 802.11ac: 16±2dBm @HT80 MCS0 /5GHz band
	IEEE 802.11n: 14±2dBm @HT20/40 MCS7 /5GHz band
	IEEE 802.11n: 16±2dBm @HT20/40 MCS0 /5GHz band
	IEEE 802.11n: 16±2dBm @HT20/40 MCS7 /2.4GHz band
	IEEE 802.11g: 16±2dBm @54MHz
	IEEE 802.11b: 18±2dBm @11MHz
Work Mode	Bridge/Gateway/AP Client
Others	
Certification	ROHS
Environment	Operating Temperature: -20°C~55°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

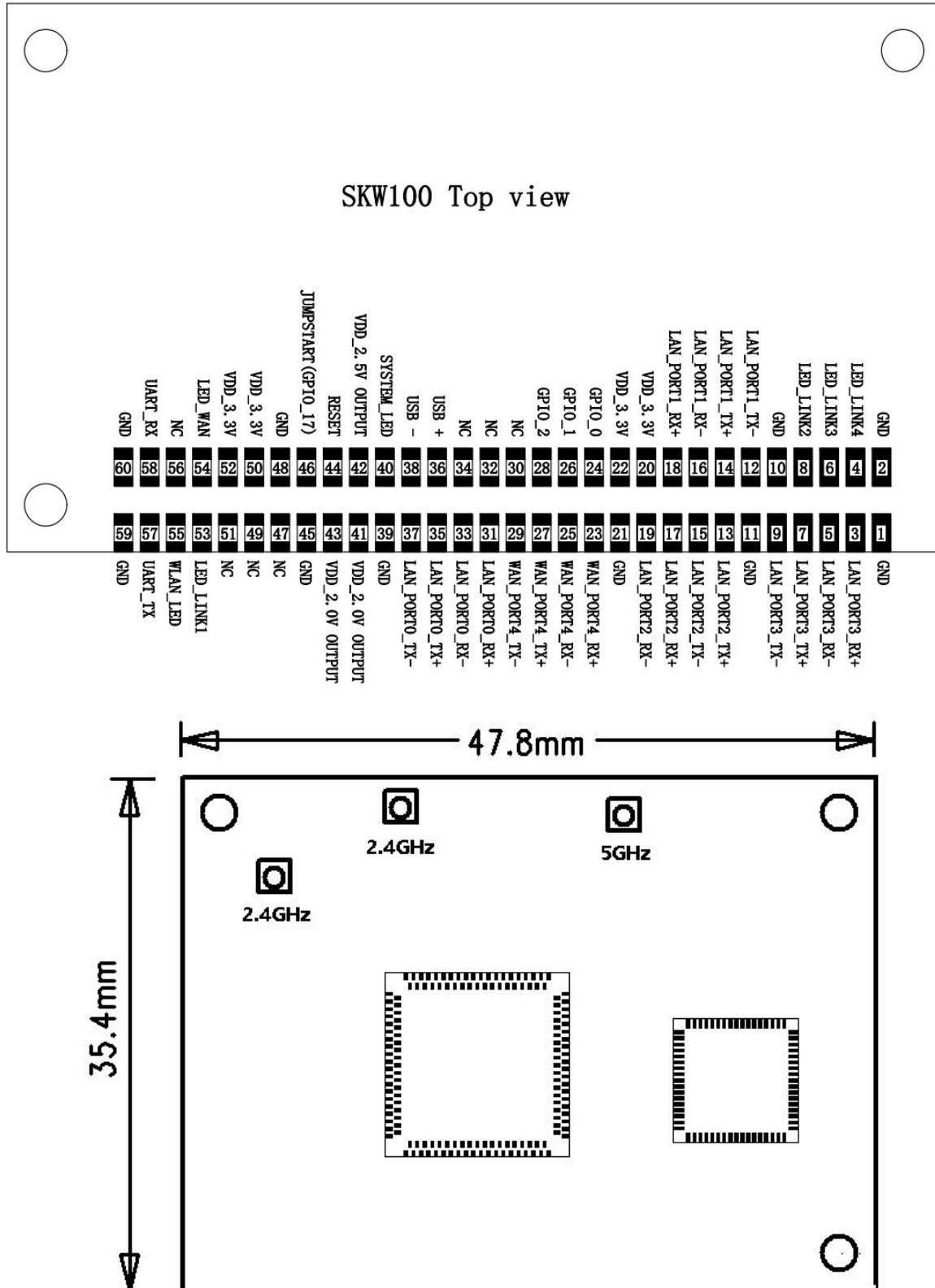


Figure 3: SKW100 Pin Package

Pin Description

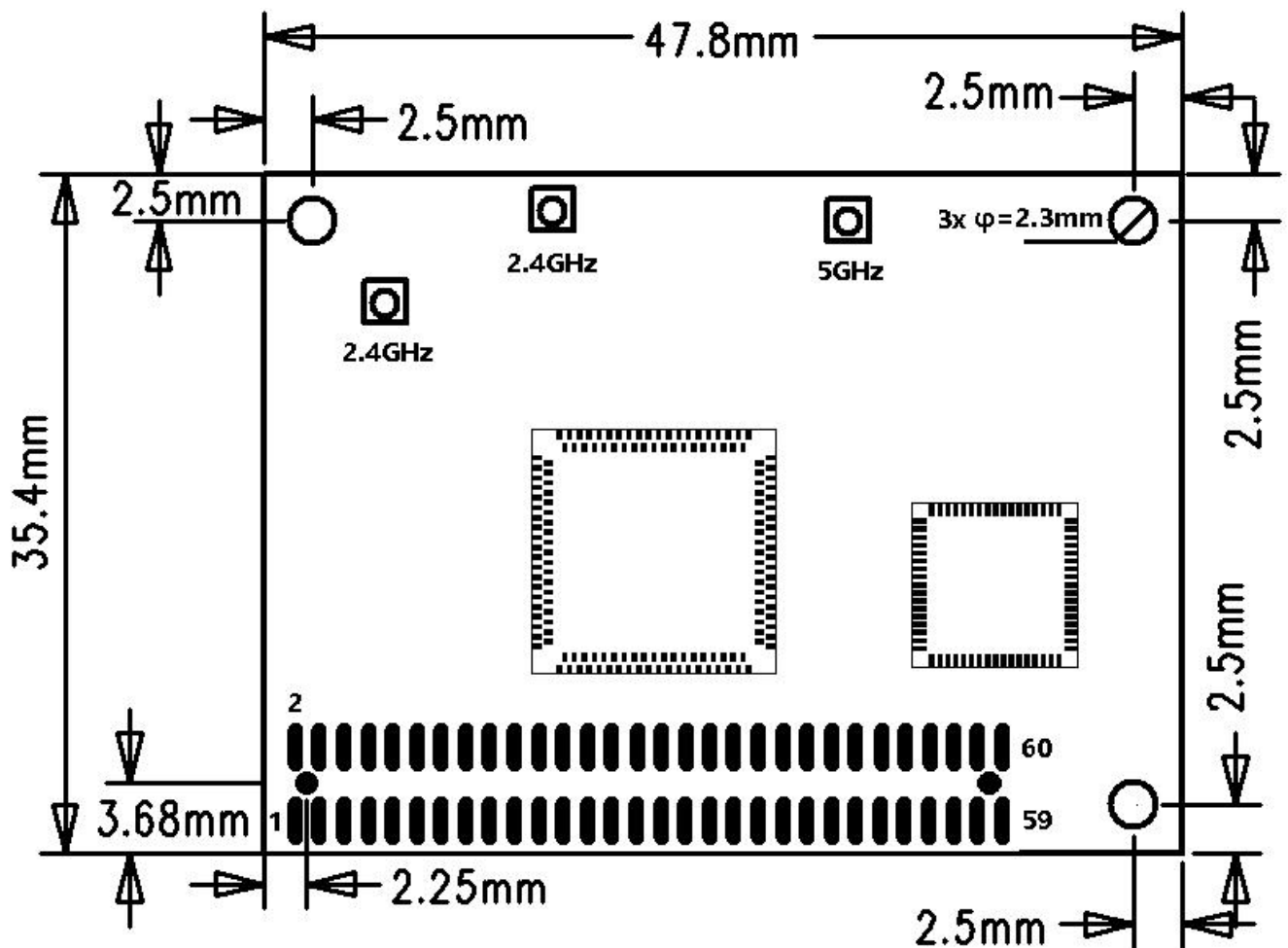
Pin No.	Pin name	Description
1	GND	Ground
2	GND	Ground
3	LAN_PORT3_RX+	Ethernet port
4	LED_LINK4	Port #3 activity LED, GPIO#11
5	LAN_PORT3_RX-	Ethernet port
6	LED_LINK3	Port #2 activity LED, GPIO#14
7	LAN_PORT3_TX+	Ethernet port
8	LED_LINK2	Port #1 activity LED, GPIO#15
9	LAN_PORT3_TX-	Ethernet port
10	GND	Ground
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 2000mA, recommended voltage 3.3V,Min2.97V, MAX 3.63V
21	GND	Ground
22	VDD_3.3V	3.3V input 2000mA, 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	Resets the firmware to its default configuration, it has a internal 10k pull-up resistance, and trigger while Pulling down
45	GND	Ground
46	JUMPSTART (GPIO_17)	KEY_INPUT to start WPS function, it has a internal 10k pull-up resistance, and trigger while Pulling down
47	NC	
48	GND	Ground
49	NC	
50	VDD_3.3V	3.3V input 2000mA, recommended voltage 3.3V, Min2.97V, MAX 3.63V
51	NC	
52	VDD_3.3V	3.3V input 2000mA, 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



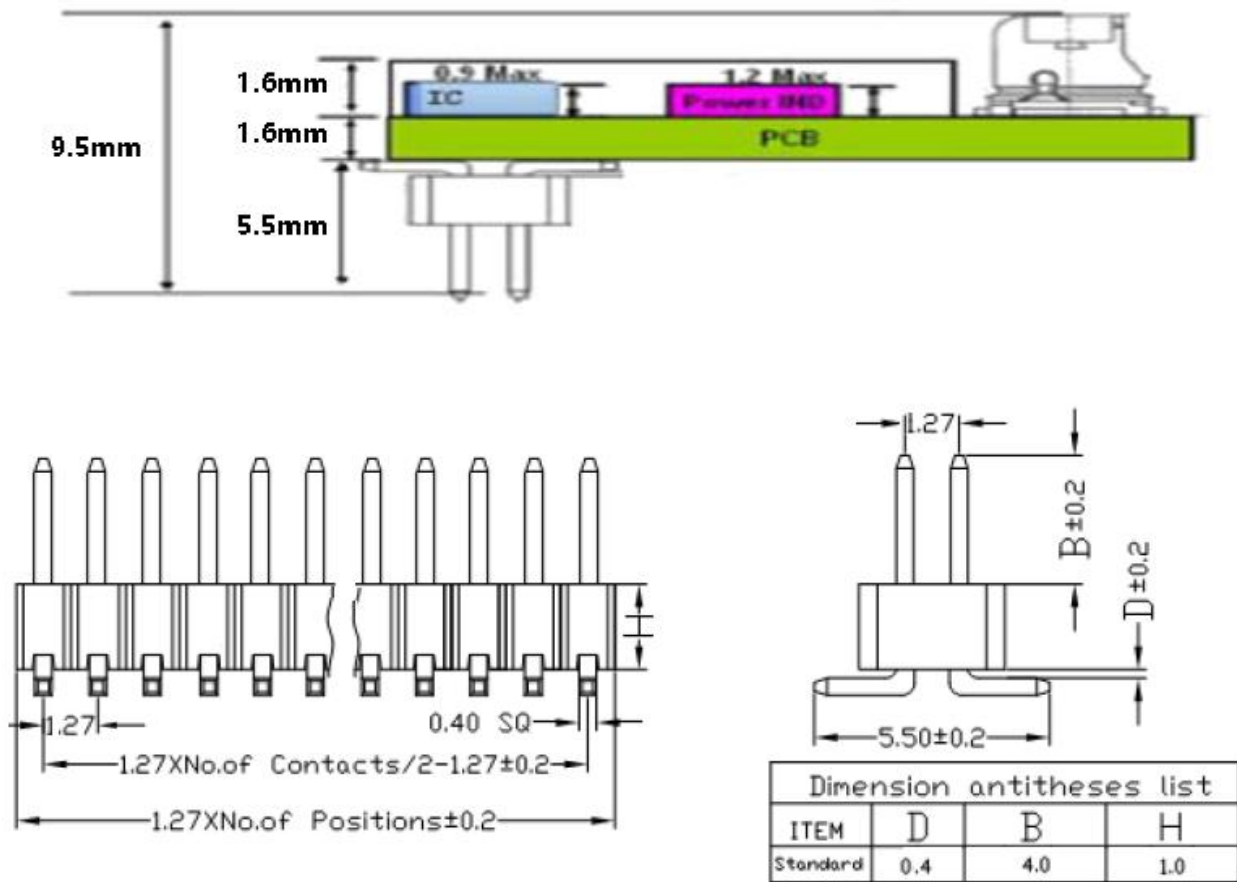


Figure 4: SKW100 Recommend PCB Footprint

9 Electrical Characteristics

a) Absolute Maximum Ratings

Table9-1: Absolute Maximum Ratings

Parameter	Condition	Min	Type	Max.	Unit
Storage temperature range		-40		85	°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

SKW100 series modules are Electrostatic Sensitive Devices and require special precautions while handling.



ESD precautions

The SKW100 module contain highly sensitive electronic circuitry and are Electrostatic Sensitive Devices (ESD). Handling the SKW100 module without proper ESD protection may destroy or damage them permanently.

The SKW100 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 SKW100 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	-20		55	°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 (Type)@3.3V	Current (Max.)@3.3V
Standby	280mA	410mA
Transmit (2.4g; +15 dBm @ TX HT20 MCS7.)	600mA	
Transmit (2.4g; +18 dBm @ 11b 11Mbps.)	850mA	1500mA

10 Ordering Information

Module No.	SPI Flash Size	DDR2 Size
SKW100_E85	8M Bytes	512M bites
SKW100_E81	8M Bytes	1024M bites
SKW100_E165	16M Bytes	512M bites
SKW100_E161	16M Bytes	1024M bites
SKW100_E325	32M Bytes	512M bites
SKW100_E321	32M Bytes	1024M bites

13 Contact Information

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