

# SKW17 – USB-Wi-Fi Module

## Datasheet

Name: 802.11n USB WiFi Module

Model NO.: SKW17

Revision: 1.0

### Revision History:

| Revision | Description | Approved | Date     |
|----------|-------------|----------|----------|
| 1.0      |             | George   | 20110818 |
|          |             |          |          |
|          |             |          |          |
|          |             |          |          |

## General Description

SKW17 is an 802.11n b/g wifi one-stream USB interface designed specifically to provide enhanced WiFi performance and value for home gateways, set-top boxes, gaming consoles, printers, IP cameras, and variety of other products that host processors not originally intended to support WiFi functions. SKW17's AR9271 single-chip features a new architecture that integrates both a CPU and memory to run more of the WiFi function on-chip. The integrated CPU offloads the wireless processing overhead from the host appliance and enables consumer electronic devices to support WiFi functions seamlessly without change of original host processors.

## Applications

- Desktop Computer
- Laptop Computer,
- IP Camera
- IP TV
- IP DVD(Internet VOD Player)
- Set Top Box
- Home Gateways
- Gaming Consoles
- Printers

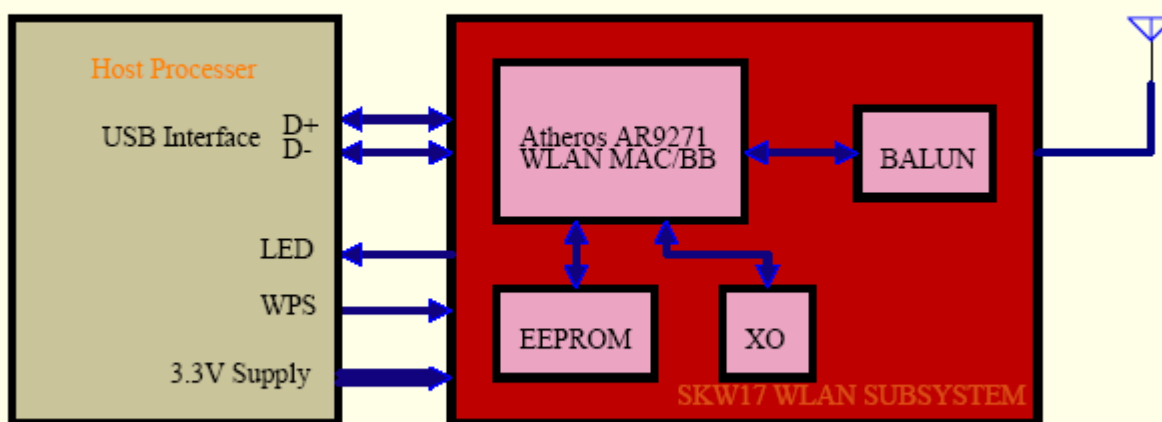


## Features

- Compliant to IEEE 802.11b/g/n WLANs
- 2.4 GHz WLAN MAC/BB processing
- WEP, TKIP, and AES hardware encryption
- Windows XP/Vista/7, and Linux drivers.
- Supported by [ath9k](#) providing Linux kernel AP/Station/IBSS/Monitor-mode drivers for industrial, academic, or personal projects at highest flexibility and lowest cost.
- USB 2.0 interface.
- Supports 72.2 Mbps for 20 MHz and 150 Mbps for 40 MHz channel operations.
- Supports IEEE 802.11b/802.11g backward compatibility allowing

- inter-operability among multiple wifi networks.
- The only one-stream 802.11n solution with one antenna port.
- RoHS compliance meets environment-friendly requirement.
- 18.5(L) x 16.6(W) x 2.75(H) mm small dimension

## Applications Block Diagram



## Performance Specification

### Wireless Specifications

|                      |                                                                                                         |
|----------------------|---------------------------------------------------------------------------------------------------------|
| Standard Conformance | 802.11b, 802.11g, and 802.11n                                                                           |
| Frequency Range      | USA: 2.400 ~ 2.483GHz<br>Europe: 2.400 ~ 2.483GHz<br>Japan: 2.400 ~ 2.497GHz<br>China: 2.400 ~ 2.483GHz |
| Modulation Technique | DSSS with CCK, DQPSK, DBPSK<br>OFDM with BPSK, QPSK, 16QAM, 64QAM                                       |
| Channel Spacing      | 5MHz                                                                                                    |
| Data Rate            | 802.11b: 1, 2, 5.5 and 11Mbps<br>802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps                              |

|                    |                                                                                                                                                                    |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | 802.11n: 20MHz channel: 1Nss: 65Mbps @ 800GI, 72.2Mbps @ 400GI (Max.)<br>40MHz channel: 1Nss: 135Mbps @ 800GI, 150Mbps @ 400GI (Max.)                              |
| Operating Channels | USA/Canada: 11 (1~11)<br>Major Europe Countries: 13 (1~13)<br>France: 4 (10~13)<br>Japan: 14 for 802.11b (1~13 or 14th), 13 for 802.11g (1~13)<br>China: 13 (1~13) |
| Wi-Fi Compliance   | Wi-Fi 2.4GHz by request                                                                                                                                            |
| Security           | 64/128/152-bit WEP encryption<br>802.1x authentication<br>AES-CCM & TKIP encryption                                                                                |

### Transmit Power And Receive Sensitivity

|                     |                                          |           |                     |
|---------------------|------------------------------------------|-----------|---------------------|
| Transmit Power      | target power tolerance $\pm 2\text{dBm}$ |           |                     |
|                     | 802.11b: +17 dBm                         |           |                     |
|                     | 802.11g: +16dBm                          |           |                     |
|                     | 802.11n HT20: +16dBm                     |           |                     |
|                     | 802.11n HT40: +14dBm                     |           |                     |
| Receive Sensitivity |                                          | Data Rate | Receive Sensitivity |
|                     | 802.11b                                  | 1M        | -82                 |
|                     |                                          | 5.5M      | -80                 |
|                     |                                          | 11M       | -76                 |
|                     | 802.11g                                  | 6M        | -82                 |
|                     |                                          | 9M        | -81                 |
|                     |                                          | 12M       | -79                 |
|                     |                                          | 18M       | -77                 |
|                     |                                          | 24M       | -74                 |
|                     |                                          | 36M       | -70                 |
|                     |                                          | 48M       | -66                 |
|                     |                                          | 54M       | -65                 |
|                     | 802.11n HT20                             | MCS0      | -82                 |
|                     |                                          | MCS1      | -79                 |
|                     |                                          | MCS2      | -77                 |

|                    |                 |                |                |
|--------------------|-----------------|----------------|----------------|
|                    |                 | MCS3           | -74            |
|                    |                 | MCS4           | -70            |
|                    |                 | MCS5           | -66            |
|                    |                 | MCS6           | -65            |
|                    |                 | MCS7           | -64            |
|                    | 802.11n<br>HT40 | MCS0           | -79            |
|                    |                 | MCS1           | -76            |
|                    |                 | MCS2           | -74            |
|                    |                 | MCS3           | -71            |
|                    |                 | MCS4           | -67            |
|                    |                 | MCS5           | -63            |
|                    |                 | MCS6           | -62            |
|                    |                 | MCS7           | -61            |
| Operation Distance |                 | Outdoor        | Indoor         |
|                    | 802.11b         | 150m @ 11Mbps  | 30m @ 11Mbps   |
|                    |                 | 300m @ 1Mbps   | 100m @ 1Mbps   |
|                    | 802.11g         | 50m @ 54Mbps   | 30m @ 54Mbps   |
|                    |                 | 300m @ 6Mbps   | 100m @ 6Mbps   |
|                    | 802.11n         | 30m @ 150Mbps  | 20m @ 150Mbps  |
|                    |                 | 250m @ 6.5Mbps | 100m @ 6.5Mbps |

## Electrical Characteristics

### Absolute Maximum Rating

| Parameter                         | Symbol                | Min | Max  | Units |
|-----------------------------------|-----------------------|-----|------|-------|
| Supply Voltage                    | VDD_3V3               | 0.3 | 4    | V     |
| RF input (reference to 50 Ω)      | RF <sub>in</sub>      |     | 10   | dBm   |
| Storage Temperature               | T <sub>store</sub>    | 65  | 150  | °C    |
| Junction Temperature              | T <sub>junction</sub> |     | 125  | °C    |
| Electrostatic Discharge Tolerance | ESD                   |     | 2000 | V     |

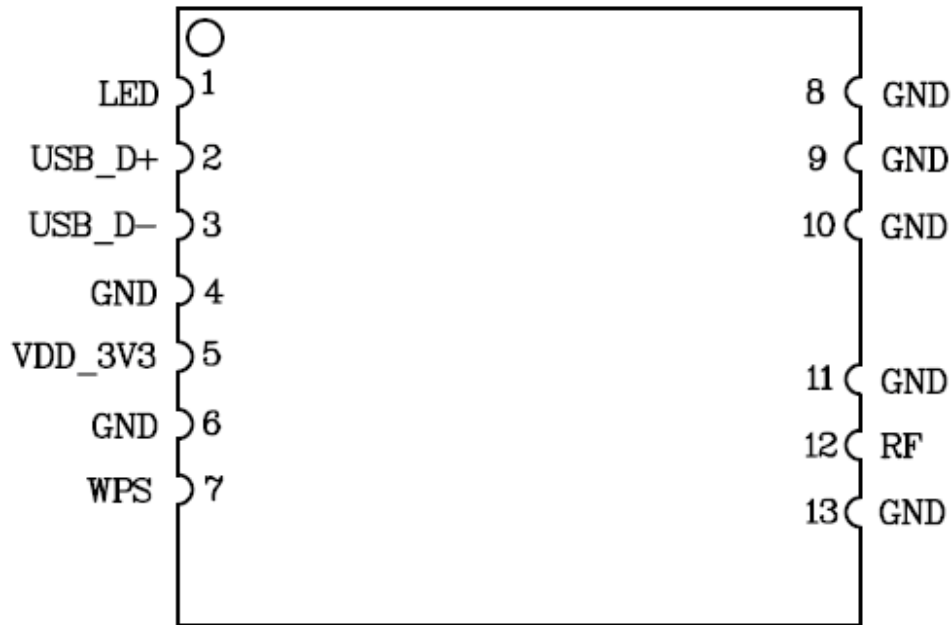
### Operating Conditions

| Parameter                    | Symbol            | Min | Typ | Max | Units |
|------------------------------|-------------------|-----|-----|-----|-------|
| Supply Voltage               | VDD_3V3           | 3   | 3.3 | 3.6 | V     |
| RF input (reference to 50 Ω) | RF <sub>in</sub>  |     | 10  | dBm | dBm   |
| Case temperature             | T <sub>case</sub> | 0   | 45  | 110 | °C    |
| Thermal Parameter            | PsiJT             |     |     | 2.8 | °C/W  |
| LED, WPS                     |                   |     |     | 24  | mA    |

### Power Consumption for 2.4 GHz Operation

| Mode    | Operating Mode | VDD_3V3(mA) |
|---------|----------------|-------------|
| HT40    | Sleep          | 2           |
|         | TX             | 462         |
|         | RX             | 216         |
| HT20    | Sleep          | 2           |
|         | TX             | 452         |
|         | RX             | 166         |
| 802.11g | Sleep          | 2           |
|         | TX             | 452         |
|         | RX             | 166         |
| 802.11b | Sleep          | 2           |
|         | TX             | 433         |
|         | RX             | 155         |

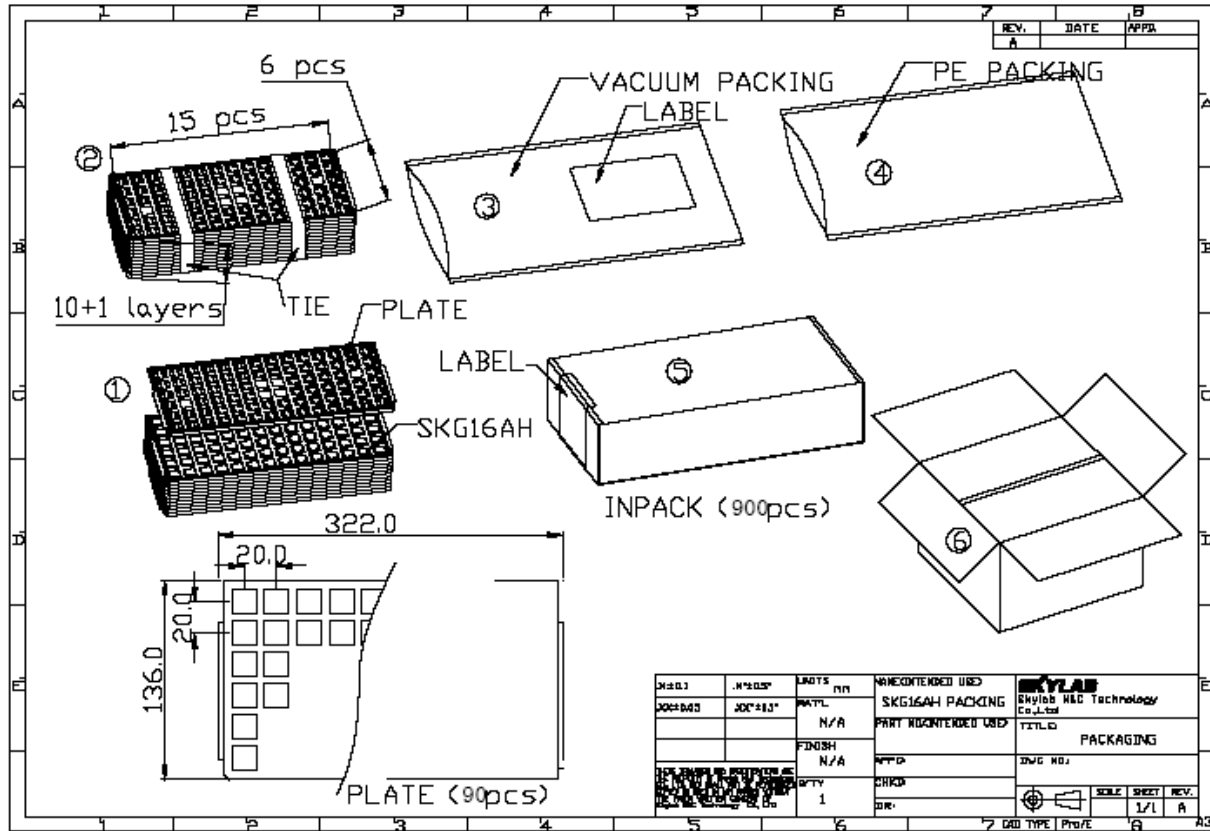
## Module Pinout



## Pin Description

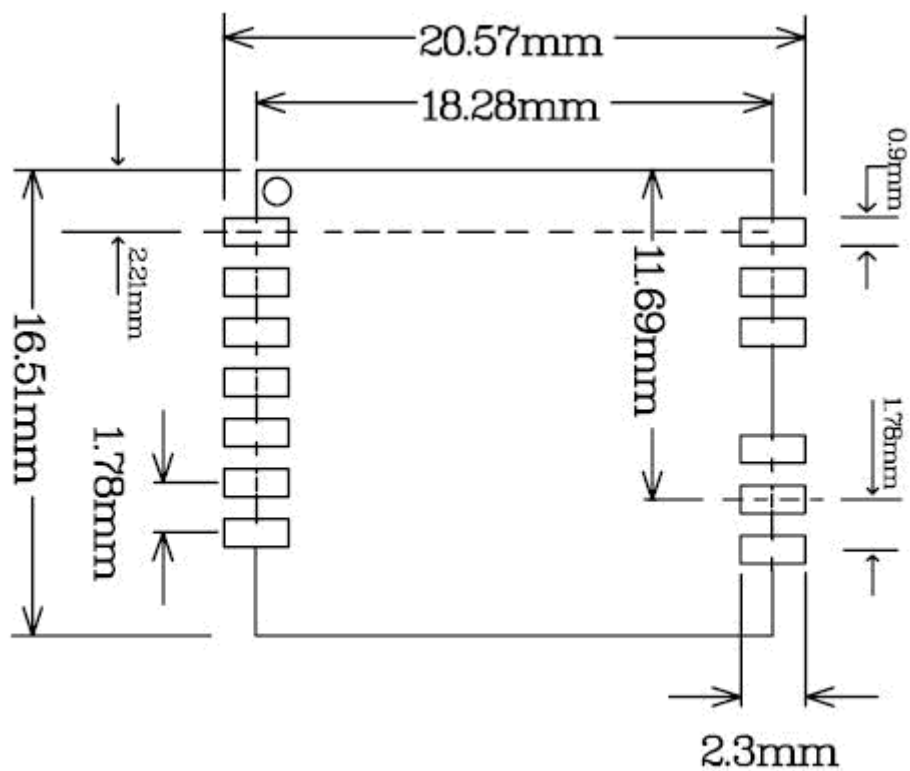
| Pin No. | Pin name | I/O     | Description                 | Remark            |
|---------|----------|---------|-----------------------------|-------------------|
| 1       | LED      | O       | Light Emitting Diode Driver | up to 24mA        |
| 2       | USB_D+   | I/O     | USB Interface DP            |                   |
| 3       | USB_D-   | I/O     | USB Interface DM            |                   |
| 4       | GND      | G       | Ground                      |                   |
| 5       | VDD_3V3  | P       | Module Power Supply         |                   |
| 6       | GND      | G       | Ground                      |                   |
| 7       | WPS      | I       | Wi-Fi Protected Setup       | 250 K $\Omega$ PU |
| 8       | GND      | G       | Ground                      |                   |
| 9       | GND      | G       | Ground                      |                   |
| 10      | GND      | G       | Ground                      |                   |
| 11      | GND      | G       | Ground                      |                   |
| 12      | RF       | RF port | Antenna                     | 50 OHM@2.4GHz     |
| 13      | GND      | G       | Ground                      |                   |

## Packaging Specification





## PCB Footprint and Dimensions





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