Neoway,有方

W30 Specifications

Version 1.1



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Notice

This document provides guide for users to use *W30 Wi-Fi module*.

This document is intended for system engineers (SEs), development engineers, and test engineers.

The information in this document is subject to change without notice due to product version update or other reasons.

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V1.0	Initial draft	2017-04
V1.1	 Modified the definition of some pins Added W30 pictures Modified operating temperature range 	2017-09

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1 Overview

W30 is a compact low-power module that supports WLAN, Bluetooth, and Audio. It is developed on Qualcomm QCA9377 chipset and in compliant with the IEEE 802.11 standards, so it supports 2.4 GHz and 5 GHz WLAN for high-speed data transmission. The Bluetooth function is compliant with BT4.1 protocol and compatible with earlier versions, and also supports BLE mode. The Audio function is developed on the REALTEK chipset, supports different audio codecs, and provides high-quality audio through various processing interfaces.

The module is used with N720 in notebooks, wireless routers/MIFI, Internet of vehicle (IoV), smart home, industrial automation and other equipment.

- QCA9377: WLAN and BT support low-consumption SDIO 3.0, and UART/PCM interfaces
- Compliant with IEEE 802.11a/b/g/n/ac WLAN protocol, BT 4.1+HS, compatible with BT 1.x and BT 2.x
- Support 2.4GHz and 5GHz WLAN, 80 MHz at most
- Support earphone, SPK, and MIC analog audio interface

2 Basic Features

Table 2-1 W30 features

Specifications	Description
Power supply	3.3V
Idle current	< 20 mA
Current in sleep mode	< 10 mA
	Operating temperature: -25°C to +85°C
Temperature	Storage temperature: -45°C to +90°C
WLAN feature	SDIO3.0 interface Compliant with IEEE802.11a/b/g/n/ac standards Supports 5 GHz 802.11ac, and 2.4GHz/5GHz 802.11n Supports 20 MHz, 40 MHz@2.4GHz Supports 20 MHz, 40MHz, 80MHz@5GHz Maximum number of APs allowed to access: 15
Bluetooth feature	Supports BT4.1, compatible with BT4.0, BT3.0, BT2.x and BT1.x Supports GFSK, π/4-DQPSK, 8-DPSK and LE modulation PCM/UART data communication interfaces
Audio feature	PCM data communication interfaces I2C interface ADC: 94dBA SNR, DAC: 94dBA SNR Two analog audio input: a single-end input, a differential input Two analog audio output: an output without gain, an output with 20 mW gain Adjustable I/O volume MIC and SPK analog audio interface Earphone detection
Wireless rate	WLAN 2.4GHz: 802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n (20MHz): MCS0~MCS7 802.11n (40MHz): MCS0~MCS7 802.11ac: MCS0~MCS9 WLAN 5GHz: 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n/ac (20MHz): MCS0~MCS7 802.11n/ac (40MHz): MCS0~MCS7 802.11ac (80MHz): MCS0~MCS7
Antenna feature	1x1 Wi-Fi/BT antenna interface, 50Ω impedance

3 Specifications

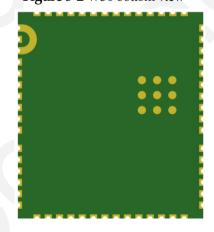
Table 3-1 specifications

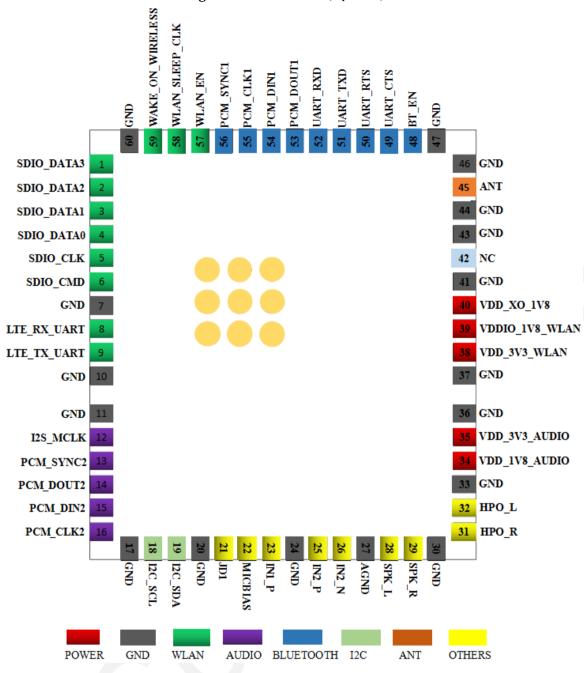
Specification	W30
Dimensions	20 mm * 18 mm * 2.3 mm (H x W x D)
Weight	1.8g
Package	60-Pin LCC

Figure 3-1 W30 top view



Figure 3-2 W30 bottom view





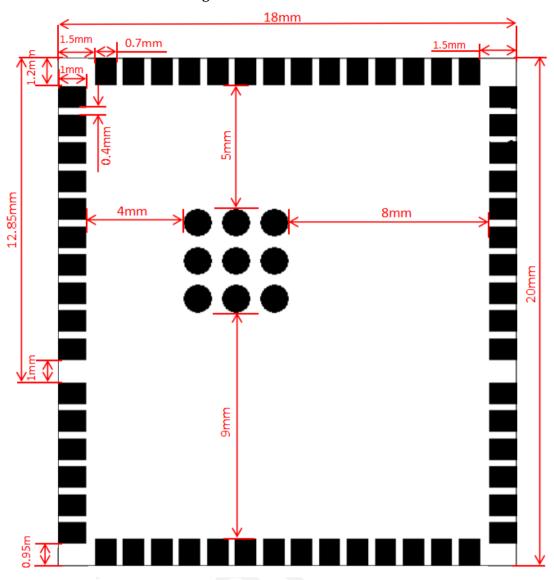


Figure 3-4 PCB bottom view

4 PCB Foot Print

W30 adopts LCC packaging. Figure 4-1 shows the recommended PCB foot print (unit is mm). It is recommended to extend the pin pad by around 1 mm, to effectively prevent the short circuit caused by irregular flow of solder during soldering and facilitate manual welding. Do not lay out any traces under the keep out area.

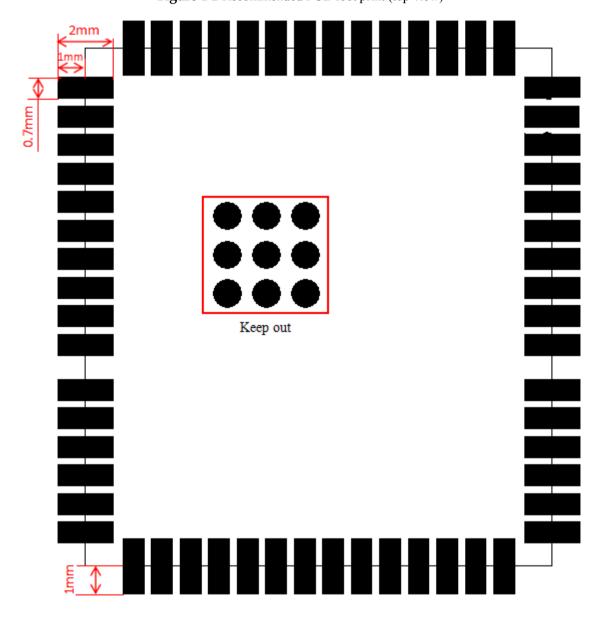


Figure 4-1 Recommended PCB foot print (top view)

5 Electric Feature and Reliability

5.1 Temperature

Table 5-1 Temperature feature

Module Status	Minimum Value	Typical Value	Maximum Value
Work	-25°C	25°C	85°C
Storage	-45°C		90°C



If the module operates at a temperature that exceeds the operating temperature range of the module, the RF indicators and performance of the Wi-Fi and Bluetooth function may deteriorate, or the audio will fail to work properly.

5.2 Work Band

Table 5-2 Work band

Work band	Parameter	Frequency
WLAN 2.4GHz	Center channel frequency	2412~2484 MHz
WLAN 5GHz	Center channel frequency	4900~5925 MHz
Bluetooth	Center channel frequency	2402~2480 MHz

5.3 TX Power and RX Sensitivity

Table 5-3 TX Power and RX Sensitivity

Band	Rate	Transmitting Power	Receiving Sensitivity
802.11b (2.4G)	1/2/5.5/11Mbps	15 dBm	-75 dBm
902 11 ~ (2 4C)	6/9/12/18/24/36Mbps	14 dBm	-75 dBm
802.11g (2.4G)	48/54Mbps	13.5 dBm	-70 dBm
902 11 _m (2.4C, 20MHz)	MCS0~MCS4	14 dBm	-70 dBm
802.11n (2.4G, 20MHz)	MCS5~MCS7	13.5 dBm	-65 dBm
202 11n (2.4C 40MHz)	MCS0~MCS4	13.5 dBm	-67 dBm
802.11n (2.4G, 40MHz)	MCS5~MCS7	12.5 dBm	-60 dBm
802.11ac (2.4G, 20MHz)	MCS8	12 dBm	-57 dBm
802.11ac (2.4G, 40MHz)	MCS9	11 dBm	-55 dBm
902 11 ₀ (5C)	6/9/12/18/24Mbps	12 dBm	-74 dBm
802.11a (5G)	36/48Mbps	11 dBm	-67 dBm

	54Mbps	10 dBm	-65 dBm
	MCS0~MCS2	12 dBm	-76 dBm
802.11n/ac (5G, 20MHz)	MCS3~MCS5	11 dBm	-65 dBm
	MCS6~MCS7	9.5 dBm	-62 dBm
	MCS0~MCS2	11 dBm	-75 dBm
802.11n/ac (5G, 40MHz)	MCS3~MCS6	10 dBm	-62 dBm
	MCS7	9 dBm	-60 dBm
802.11ac (5G, 80MHz)	MCS8~MCS9	6.5 dBm	-50 dBm
	GFSK	8 dBm	-92 dBm
Bluetooth	π/4-DQPSK	7 dBm	-92 dBm
Diuctootii	8-DPSK	7 dBm	-85 dBm
	LE	3 dBm	-95 dBm



The above indicators are test in a laboratory environment. The receiver sensitivity is obtained when the bit error rate is less than 10%.

5.4 EMI/EMC

Electronic products must pass rigorous ESD tests. The following table shows the ESD capability of key pins of the module. Add ESD protection to those pins in accordance to the application to ensure product quality when designing products.

Table 5-4 ESD feature

Testing Point	Contact Discharge	Air Discharge
V3P3	±8 kV	±15 kV
GND	±8 kV	±15 kV
ANT	±8 kV	±15 kV
Cover	±8 kV	±15 kV
Others	±2 kV	±4 kV



Test environment: humidity: 45%, temperature: 25°C



6 Mounting

W30 is compatible with industrial standard reflow profile for lead-free SMT process.

The reflow profile is process dependent, so the following recommendation is just a start point guideline:

- Only one flow is supported.
- Quality of the solder joint depends on the solder volume. The stencil thickness of 0.12 mm to 0.15 mm is recommended.
- Use bigger aperture size of the stencil than actual pad size.
- Use a low-residue, no-clean type solder paste.

W30 uses multi-layer HDI board so that it is difficult to solder. For information about cautions in W30 storage and mounting, refer to *Neoway Module Reflow Manufacturing Recommendations*.

When maintaining and manually desoldering it, use heat guns with great opening, adjust the temperature to 250 °C (depending on the solder paste type), and heat the module till the solder paste is melt. Then remove the module using tweezers. Do not shake the module in high temperature while removing it. Otherwise, the components inside the module might get misplaced.



7 Packaging and Storage

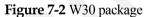
7.1 Packaging

W30 modules are packaged in sealed bags on delivery to guarantee a long shelf life. Package the modules again in case of opened for any reasons.

If the modules are exposed to air for more than 48 hours at conditions not worse than 30°C/60% RH, a baking procedure should be done before SMT or, if the indication card shows humidity greater than 20%, the baking procedure is also required. The recommended baking conditions are 90°C/12 hours. Do not bake modules with the package tray directly.



Figure 7-1 W30 Tray





7.2 Storage Conditions

Temperature: $20^{\circ}\text{C} \sim 26^{\circ}\text{C}$ Humidity: 40% - 60%

Period: 120 days