



a module solution provider

## **WN8020-00 WLAN USB Module**

**Ralink IEEE 802.11 b/g/n solution**

# **USER MANUAL**

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## 1. OVERVIEW

WN8020-00 is high performance and cost effective 802.11b/g/n WLAN USB module. WN8020-00 is embedded with Ralink RT3070 a highly integrated MAC/BBP and 2.4GHz RF single chip with 150Mbps PHY rate supporting. It fully complies with IEEE 802.11n draft 3.0 and IEEE 802.11b/g feature rich wireless connectivity at high standards, cost-effective, throughput from extended distance. Optimized RF architecture and baseband algorithms provide superb performance and low power consumption.



WN8020 is designed to support standard based features in the areas of security, quality of service and international regulation, giving end users the greatest performance anytime in any circumstance.

### Feature

- Host Interface USB2.0
- 1T1R with up to 150Mbps PHY Data Rate for Both TX and RX
- LGA 38 pin package, including 4 ground pads.
- Dimension 11.6±0.2(W) x 16.9±0.2 (L) x 1.4(H) mm without shielding case
- 20MHz/ 40MHz Bandwidth Support
- Legacy and High Throughput Modes
- Support Antenna Diversity
- Support Bluetooth Coexistence 2-wire Scheme
- Support Turn ON/OFF WLAN System Module Function for Saving Power Consumption

- Support LED Control Function (Active and Transmit Function)
- With Smaller Size Suitable for Compact System Integration
- Low Power Consumption, Extend the Battery Life
- WEP 64/128, WPA, WPA2, TKIP, AES
- QoS --- WMM, WMM-PS
- WPS-PIN, PBC
- Multiple BSSID Support
- Cisco CCX Support
- Operating Systems Support: Windows XP 32/64, Linux and Macintosh
- Low Cost
- RoHS Compliant

## **Applications**

- Netbook/ Notebook
- Printer
- Digital Photo Frame/ Camera
- Personal Navigation Device

## 2. ELECTRICAL CHARACTERISTICS

### 2.1. RF Characteristics

(Condition: VCC= 3.3V @ +25°C)

Feature	Description
Standards	Fully Compliant with IEEE 802.11 b/g/n Standard
Frequency Band	2400MHz ~ 2500MHz
Frequency Stability	< ±5ppm @Room Temperature +25°C
Modulation	OFDM and CCK
PHY Data Rate	Up to 150Mbps
Channel Bandwidth	20MHz and 40MHz
OFDM Output Power	15dBm (Typ.) @EVM<3%, all channel
CCK Spectral Mask @Pout=18dBm	-37dBc (Typ.) @ 11~22MHz -60dBc (Typ.) @ 22~33MHz
2f Harmonics	-55dBm (Typ.)
LO Leakage Peak Power	-64dBm (Typ.) @Transmit State
Receive Sensitivity	-65dBm (Typ.) @HT40M, MCS7 -71dBm (Typ.) @54M OFDM -85dBm (Typ.) @11M CCK -90dBm (Typ.) @1M CCK
RF Port Impedance	50Ω±10%
USB Differential Port Impedance	90Ω±10%
Dimension	16.7(L) x 11.4(W) x 1.4(H) mm w/o Shielding Cover

### 2.2. Absolute Maximum Ratings

Parameter Name	Min.	Typ.	Max.	Unit
Operating Temperature	-10		85	°C
Supply Voltage Range: USB VCC	4.5	5.0	5.5	V
Storage Temperature Range	-55		150	°C

### 3. SMT & BAKING RECOMMENDATION

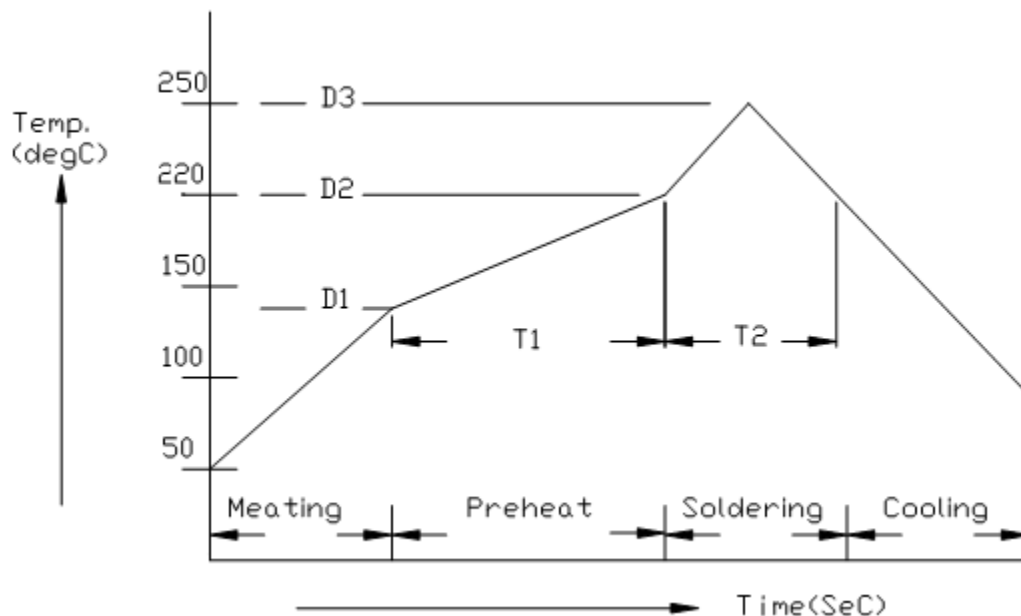
#### 3.1. Baking Recommendation

- Baking condition :
  - Follow MSL Level 4 to do baking process.
  - After bag is opened, devices that will be subjected to reflow solder or other high temperature process must be
    - a) Mounted within 72 hours of factory conditions <30°C/60% RH,
    - or
    - b) Stored at <10% RH.
  - Devices require bake, before mounting, if Humidity Indicator Card reads >10%

**If baking is required, Devices may be baked for 8 hrs at 125 °C.**

#### 3.2. SMT Recommendation

- **Recommended Reflow profile :**



No.	Item	Temperature (°C)	Time (sec)
1	Pre-heat	D1: 140 ~ D2: 200	T1: 80 ~ 120
2	Soldering	D2: = 220	T2: 60 +/- 10
3	Peak-Temp.	D3: 250 °C max	

Note: (1) Reflow soldering is recommended two times maximum.

- (2) Add Nitrogen while Reflow process : SMT solder ability will be better.

## 8. History Change

Revision	Date	Description
R 0.1	2009/04/08	Revision 0.1
R 0.2	2009/08/25	Add Feature list – package information, RoHS Compliant; Update Baking & SMT Recommendation
R 0.3	2009/08/28	Add Mechanical Side View on Page 8
R 0.4	2009/09/02	Modify Mechanical Characteristic, Add Layout Footprint Recommendation
R 0.5	2009/09/16	Modify Mechanical Characteristic
R 0.6	2010/01.05	Correct P9 GND Pin Assignment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

This module is intended for OEM integrator. The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module. 20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

#### **USERS MANUAL OF THE END PRODUCT:**

In the user manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the user manual: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### **LABEL OF THE END PRODUCT:**

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: PWQ-00EFR370000 ". If the size of the end product is larger than 8x10cm, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.