

# HK NATER TECH LIMITED

## NT -UM03C-8766模块 承认书

客户名称

**Customer:** \_\_\_\_\_

样品名称

**Description:** NT-UM03C-8766 模块 V1.0 \_\_\_\_\_

客户料号

**Customer P/N:** \_\_\_\_\_

日期

**Date:** \_\_\_\_\_

客户栏 Customer		
核准 Approve	审核 Auditing	承认 Admit

供应商栏 Provider		
核准 Approve	审核 Auditing	承认 Admit

客户名称:

公司地址:

电话:

传真:

联系人:

E-mail:

供方名称: HK NATER TECH LIMITED

公司地址: 深圳市宝安区宝民二路贤基大厦2楼

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尊敬的客户: 请收到我公司样品承认书三日内传首页, 谢谢!

# SPECIFICATIONS

## **IEEE 802.11 a/b/g/n 2.4 to 5.8GHz**

Wi-Fi (1T1R)+BT (Bluetooth 4.0+HS) Module

## **NT-UM03C-8766 (USB Module)**

Version: V1.0

## General

- The module integration of 802.11 wireless radio baseband, MAC, CPU, memory, host interfaces
- CMOS and low-swing sine wave input clock
- 40 MHz crystal clock support
- Low power operation supporting deep sleep and standby modes
- Option to power directly from a single 3.3V supply or to use 3.3V/1.8V/1.2V pre-regulated supplies
- One time programmable (OTP) memory to eliminate need for external EEPROM
- Fully compatible with Marvell Power Management device(s)

## IEEE 802.11/Standards

- 802.11 data rates of 1 and 2 Mbps
- 802.11b data rates of 5.5 and 11 Mbps
- 802.11a/g data rates 6, 9, 12, 18, 24, 36, 48, 54 Mbps for multimedia content transmission
- 802.11g/b performance enhancements
- 802.11n compliant, with maximum data rates up to 72 Mbps (20 MHz channel) and 150 Mbps (40 MHz channel)
- 802.11d international roaming
- 802.11e QoS block acknowledgement (with support for 802.11n extension)
- 802.11h transmit power control
- 802.11h DFS radar pulse detection
- 802.11i enhanced security
- 802.11k radio resource measurement
- 802.11r fast hand-off for AP roaming
- 802.11w protected management frames
- Fully supports clients (stations) implementing IEEE Power Save mode
- Wi-Fi Direct connectivity

## DMA

- Independent 4-Channel Direct Memory Access (DMA)

## Memory

- Internal SRAM for Tx frame queues/Rx data buffers
- Boot ROM
- ROM patching capability

## WLAN MAC

- Ad-Hoc and Infrastructure Modes

- RTS/CTS for operation under DCF
- Hardware filtering of 32 multicast addresses and duplicate frame detection for up to 32 unicast addresses
- On-module Tx and Rx FIFO for maximum throughput
- Open System and Shared Key Authentication services
- A-MPDU Rx (de-aggregation) and Tx (aggregation)
- 20/40 MHz coexistence
- Reduced Inter-Frame Spacing (RIFS) bursting
- Management information base counters
- Radio resource measurement counters
- Block acknowledgement with 802.11n extension
- Dynamic frequency selection (DFS)
- Transmit beamformee support
- Transmit rate adaptation
- Transmit power control
- Long and short preamble generation on a
- frame-by-frame basis for 802.11b frames
- Marvell Mobile Hotspot

## WLAN Baseband

- 802.11n 1x1 SISO
- Backward compatibility with legacy 802.11a/g/b technology
- WLAN/Bluetooth LNA sharing
- PHY data rates up to 150 Mbps
- 20 MHz bandwidth/channel, 40 MHz bandwidth/channel, upper/lower 20 MHz bandwidth in 40 MHz channel, and 20 MHz duplicate legacy bandwidth in 40 MHz channel mode operation
- Modulation and Coding Scheme (MCS)—0~7 and 32 (duplicate 6 Mbps)
- Enhanced radar detection for long and short pulse radar
- Enhanced AGC scheme for DFS channel
- Japan DFS requirements for W53 and W56
- Radio resource measurement
- Optional 802.11n SISO features:
  - 20/40 MHz coexistence
  - 1-stream STBC reception
  - Short guard interval
  - RIFS on receive path
  - Beamformee function and hardware acceleration
  - Greenfield Tx/Rx
- Power save features

## WLAN Radio

- Integrated direct-conversion radio
- 20 and 40 MHz channel bandwidths
- Integrated T/R switch for 2.4 GHz path
- Integrated power amplifiers for both 2.4 GHz and 5 GHz paths
- Optional bypass for integrated power amplifiers
- Supports external amplifier for 5 GHz path

### **WLAN Rx Path**

- Direct conversion architecture eliminates need for external SAW filter
- On-module gain selectable LNAs with optimized noise figure and power consumption
- High dynamic range AGC function in receive mode

### **WLAN Tx Path**

- Integrated power amplifiers with power control
- Closed/open loop power control (0.5 dB increments)
- Optimized Tx gain distribution for linearity and noise Performance

### **WLAN Local Oscillator**

- Fractional-N for multiple reference clock support
- Fine channel step

### **WLAN Encryption**

- WEP 64- and 128-bit encryption with hardware TKIP processing (WPA)
- AES-CCMP hardware implementation as part of 802.11i security standard (WPA2)
- Enhanced AES engine performance
- AES-Cipher-Based Message Authentication Code (CMAC) as part of the 802.11w security standard
- WLAN Authentication and Privacy Infrastructure (WAPI)

### **Bluetooth**

- Bluetooth 4.0 + HS
- Bluetooth Class 2
- Bluetooth Class 1
- Single-ended, shared Tx/Rx path for Bluetooth
- Shared LNA for WLAN/Bluetooth
- Baseband and radio BDR and EDR packet types—1 Mbps (GFSK), 2 Mbps ( /4-DQPSK), and 3 Mbps (8DPSK)

- Fully functional Bluetooth baseband—AFH, forward error correction, header error control, access code correlation, CRC, encryption bit stream generation, and whitening
- Adaptive Frequency Hopping (AFH) including Pack
- Loss Rate (PLR) and RSSI
- Interlaced scan for faster connection setup
- Simultaneous active ACL connection support
- Automatic ACL packet type selection
- Full master and slave piconet support
- Scatternet support
- Standard USB HCI transport layer
- HCI layer verified to function with major profile stack vendors
- SCO/eSCO links with hardware accelerated audio signal processing and hardware supported PPEC algorithm for speech quality improvement
- All standard SCO/eSCO voice coding
- All standard pairing, authentication, link key, and encryption operations
- Standard Bluetooth power saving mechanisms (i.e., hold, sniff modes and sniff-subrating)
- Enhanced low power scan mode
- Dynamic Transmit Power Control (TPC)
- Channel Quality Driven (CQD) data rate
- SBC off load for A2DP streaming
- Wideband Speech support

## **Bluetooth Low Energy (BLE)**

- Advertiser, Scanner, Initiator, Master, and Slave roles support (connects up to 64 links)
- WLAN/Bluetooth Coexistence (BCA) protocol support
- Shared RF with BDR/EDR
- Encryption (AES) support
- Hardware support for intelligent Adaptive Frequency Hopping (AFH)
- BDR/EDR, LE, and WLAN coexistence

## **Host Interfaces**

- PCIe v2.1 (2.5 Gbps) and USB 2.0 interfaces

## **Coexistence**

- Advance coexistence support for internal Bluetooth and WLAN

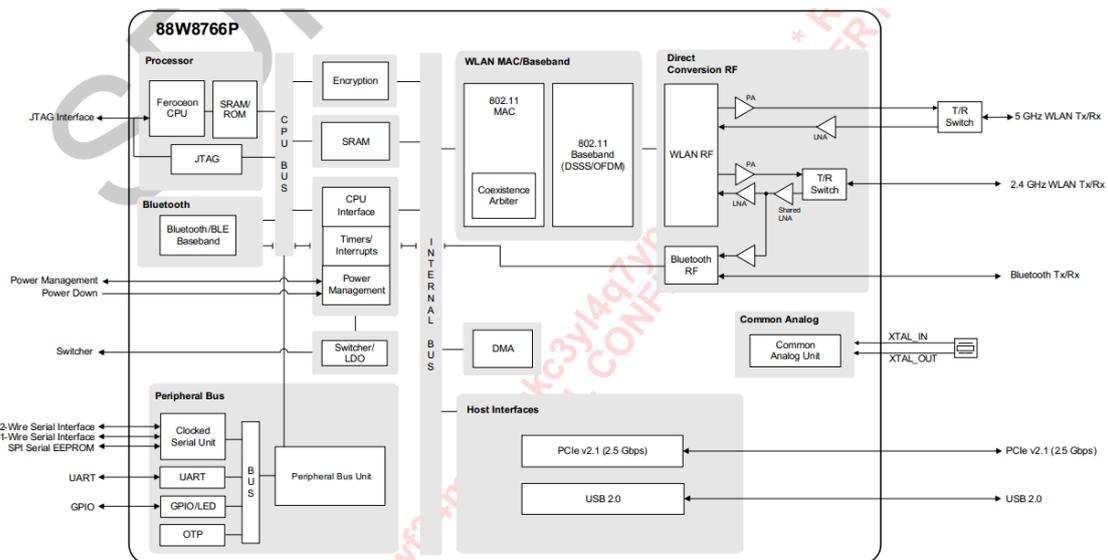
## **Peripheral Bus Interfaces**

- Clocked Serial Unit (CSU)
  - 2-Wire Serial Interface (TWSI)
  - 1-Wire Serial Interface
  - SPI Serial (EEPROM) Interface
- 16550 UART
- General Purpose Input Output (GPIO)
- One-Time Programmable (OTP) memory to eliminate need for external EEPROM

## Applications

- Laptop/Netbook
- Imaging platforms (printers, digital picture frames)
- Gaming platforms
- Consumer electronic devices (TV, DVD players, Blu-ray players, etc.)

## Block Diagram



## General Specification

Model	NT-UM03C-8766-V1.0
Product Name	WLAN 11 a/b/g/n USB2.0 module
Major Chipset	88W8766P
Power Consumption	3.3 V ±0.2V I/O supply voltage
Operating	-10 ~ 70°C ambient temperature

Temperature	
Storage Temperature	-10 ~ 70°C ambient temperature
Humidity	5 to 90 % maximum (non-condensing)
Dimension	27.0 x 13.5 x 1.9mm (LxWxH) +-0.2MM
<b>WIFI Specification</b>	
Standard	WIFI: IEEE802.11 a/b/g/n
Data Transfer Rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,60,90,120 and maximum of 150Mbps
Modulation Method	DSSS,DBPSK, DQPSK, CCK and OFDM (BPSK/QPSK/16-QAM/ 64-QAM)
Frequency Band	2.4GHz ~ 5.8 GHz
Spread Spectrum	IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum) ,CCK(Com plem e ntary Code Keying) IEEE 802.11g/n:OFDM (Orthogonal Frequency Division Multiplexing)
RF Output Power	WIFI: < 18dBm@11b;< 14dBm@11g ;< 13dBm@11n; < 12dBm@11a
Receiver Sensitivity	WIFI: 11Mbps-86dBm@8%,135Mbps-68dBm@10%
Operation Range	Up to 180 meters in open space
Security	WEP64, WPA, WPA2 ,CMAC,WAPI
Host Interface	USB2.0
Operating Channel	WIFI2.4GHz: 11: (Ch. 1-11) – United States; 13: (Ch. 1-13) – Europe ; 14: (Ch. 1-14) – Japan WIFI 5.8 GHz:
<b>Bluetooth Specification</b>	
Standard	BT v4.0 +HS
Modulation	FHSS,GFSK,DPSK,DQPSK
Frequency Band	2.400GHz ~ 2.483.5 GHz
Output Power	10dBm&class1.5 ; 2dBm&class2
Sensitivity	-86dBm@1Mbps(GFSK) ; -86dBm@2Mbps( $\pi$ /4-DQPSK ) ; -80dBm@3Mbps ( 8DPSK)
Host Interface	USB2.0
Number Channel	79 Channels
Maximum input level	GFSK (1Mbps): -20dBm
	$\pi$ /4-DQPSK(2Mbps):-20dBm
	8DPSK(3Mbps):-20dBm

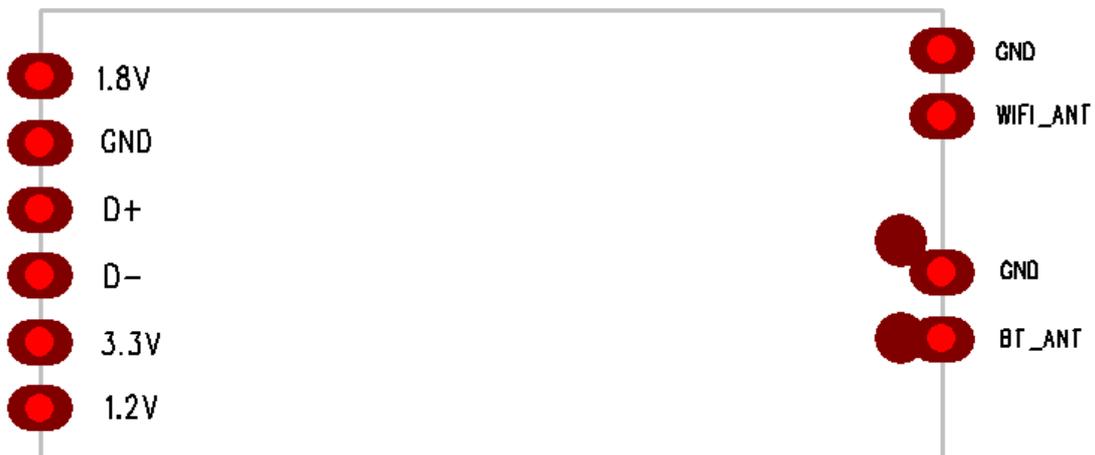
# Mechanical

Dimensions (mm)	Length	Width	Height
	27.0 (Tolerance:±0.2mm)	13.5 (Tolerance:±0.2mm)	1.9 (Tolerance:±0.2mm)

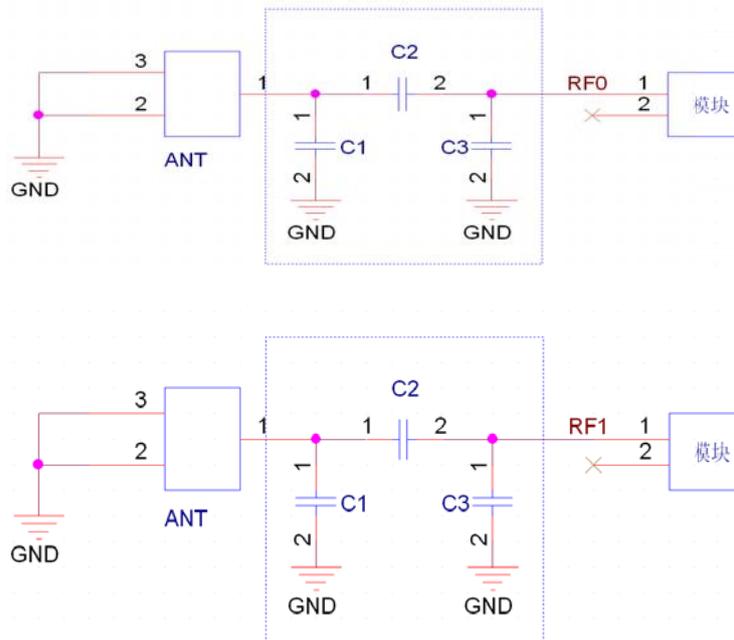


# Module Pin Assignment

Pin	Function	Pin	Function
H1	1.8V	H6	1.2V
H2	GND	H7	GND
H3	D+	H8	WIFI_ANT
H4	D-	H9	GND
H5	3.3V	H10	BT_ANT



## WIFI RF Circuit reference pictures



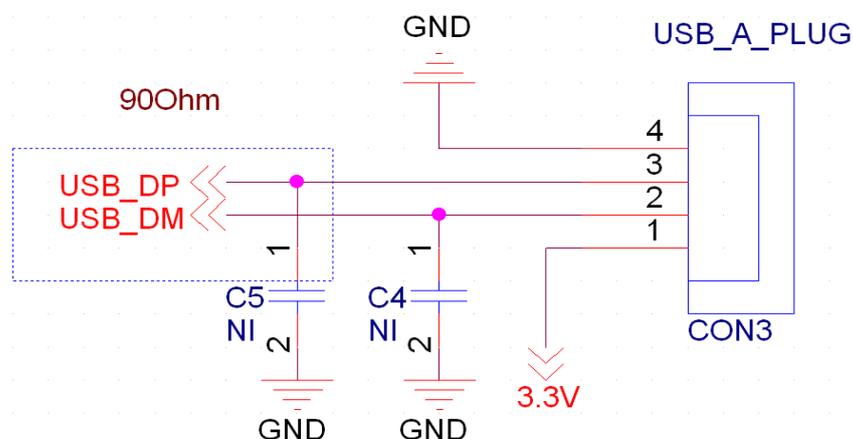
注:1.以上虚线框的部分需要进行天线匹配,以实际天线匹配的电子参数为准.

2.以上为 RF 走线要做 50 欧姆阻抗,走线不能走 90 度,走线长度不能超过 15mm.

Note: 1.Above the dotted box part of the antenna matching is needed, the actual antenna matching electronic parameters shall prevail.

2.For RF part layout to do 50 ohm impedance. can't go on 90° of layout .The line length can't more than 15 mm.

## USB interface electrical characteristics



注: 1.USB 数据线需要做 90Ohm 的阻抗。

2.建议电源输入端留一个电源开关,每次开关卡时可以做一个上电断电的作用

可以使用 wifi 复位，就不会有打不开 wifi 的错误现象出现。

Note:1.Two root go line do difference , but also required to make 90Ohm the impedance test.e get lock can do

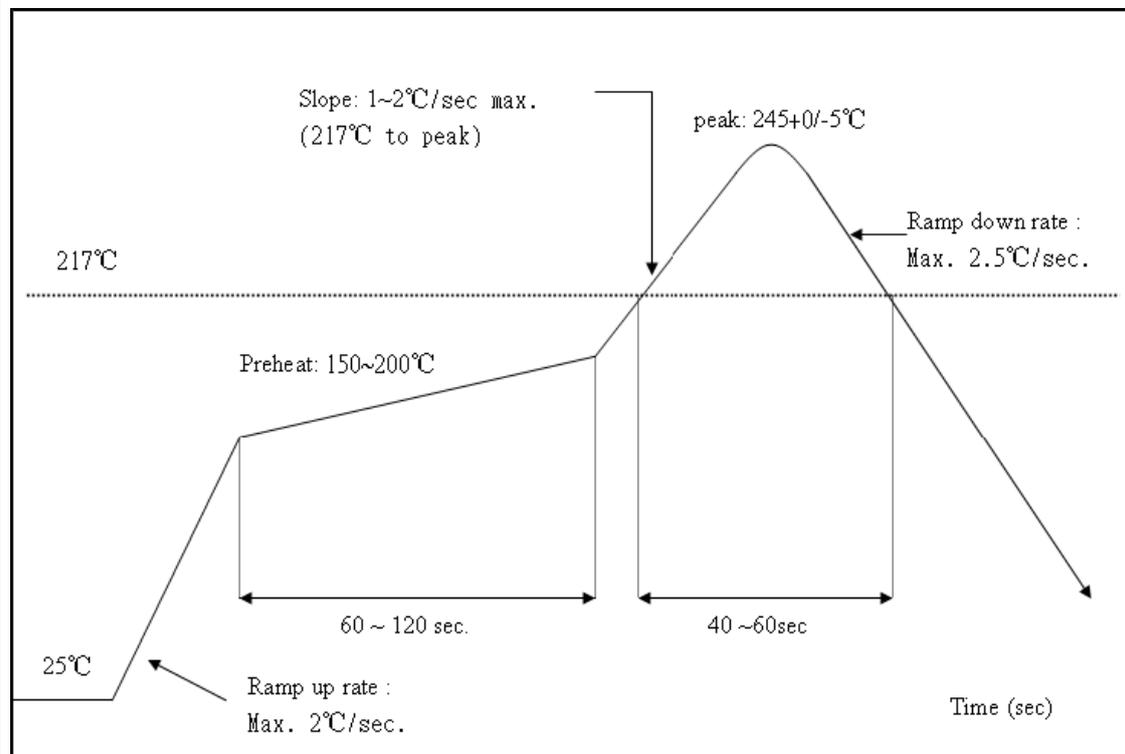
2.Suggested that leave a power switch power supply input terminal ,every tim a electric power is on

## Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature :  $<250^{\circ}\text{C}$

Number of Times :  $\leq 2$  times



## ENVIRONMENTAL

### Operating

Operating Temperature:  $0^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$

Relative Humidity: 5-90% (non-condensing)

### Storage

Temperature:  $-40^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$  (non-operating)

Relevant Humidity: 5-95% (non-condensing)

### MTBF caculation

Over 150,000hours

### **Patch WIFI module installed before the Note:**

1. customers must open stencil WIFI module pad holes open, press 1 to 1 0.7mm proportion to open outward expansion, thickness 0.12MM.

2. there is need to take a WIFI mode must not bare hands to pick up the WIFI module, be sure to wear gloves and a wrist strap.

3. the furnace temperature according to the size of the customer's motherboard, usually like stickers on a tablet 250 + -5 degrees.

4. Module vacuum packaging, storage and use of controls should note the following:

➤ module reel plus vacuum packaging storage period:

Shelf life: 12 months Storage Conditions: Temperature in: <40 ° C,Relative Humidity: <90% R.H

■ The module vacuum packaging unpacking, assembly time frame:

➤ Check the humidity indicator card: display value should be less than 30% (blue), such as: 30% ~ 40% (pink) or greater than 40% (red) indicates that the module has the absorbent gas.

➤ the factory environment temperature and humidity control: <30% ° C, <60% RH.

➤ After unpacking, the the workshop shelf life of 168 hours.

■ Module vacuum packing once opened , if not used within 168 hours End:

➤ module to be re-baking, remove the module moisture problems.

➤ Baking temperature: 125 ° C, 8 hours.

➤After baking, put the right amount of desiccant resealable packaging.

5.Module vacuum packaging for 2000 PCS per disk.

■ The reel module packaging items as below

■ Reel packing 2000 PCS per disk

■ Reel packing after opening,If not used up within 48 hours,module to be re-baking, remove the module moisture problems. Baking temperature: 125 ° C, 8 hours.

6.Module pallet packaging considerations are as follows.

■ Pallet packaging each plate is 100 pcs

■ If not used up within 48 hours,module to be re-baking, remove the module moisture problems. Baking temperature: 125 ° C, 8 hours.

Note: the above packaging according to customer requirements, the packaging will be subject to actual material.