

HK NATER TECH LIMITED

WL-UM01WBS-7632 Specification

Customer: _____

Description: WL-UM01WBS-7632-V1.0

Customer P/N: _____

Date: _____

Customer		
Approve	Auditing	Admit

Provider		
Approve	Auditing	Admit

Customer:

Add:

Tel:

Fax:

Attn:

E-mail:

Provider:HK NATER TECH LIMITED

Add: 2F,NO.27,2 Baomin Rd.,Baoan Dist.SZ City,China

Tel:0086-755-61522172/13510620050

Fax:0086-755-61522171

Attn:Lingo

E-mail:hsdgood@163.com

SPECIFICATIONS

IEEE 802.11 a/b/g/n 2.4GHz+5G

WiFi 2T2R+BT 4.0 Module

WL-UM01WBS-7632-V1.0

Version: V1.0

1.General Description

The MT7632U is a highly integrated single chip which has built in a 2x2 dual-band wireless LAN radio and Bluetooth radio. It supports IEEE 802.11a/b/g/n standard and provides the highest PHY rate up to 300Mbps, offering feature-rich wireless connectivity and reliable throughput from an extended distance. It includes Bluetooth EDR and LE radio which complies with Bluetooth v2.1+EDR, v3.0, and v4.0+BLE.

Optimized RF architecture and baseband algorithms provide superb performance and low power consumption. MT7632U integrates PA/LNA such that the number of the external components is reduced to minimum. Intelligent MAC design deploys a high efficient DMA engine and hardware data processing accelerators which offloads the host processor.

The MT7632U supports the 802.11i security standard and implements hardware acceleration for TKIP, CCMP and WAPI. The device also supports 802.11e QoS for video, voice, and multimedia applications.

The MT7632U can provide a concurrent operation of Wi-Fi and Bluetooth over USB interface. An intelligent Wi-Fi/Bluetooth coexistence algorithm is implemented to reach the best Wi-Fi and Bluetooth

radio performance. MT7632U also features the high-speed UART with SIG standard HCI interface to support Bluetooth over UART.

2. Features

Platform

- Embedded high-performance 32-bit RISC microprocessor
- Highly integrated RF with 55nm CMOS technology
- Integrate high efficiency switching regulator
- 20/40MHz crystal clock support with low power operation in sleep mode
- Best-in-class active and idle power consumption performance
- Fully Compliance with USB v2.0
- Advanced FDD/TDD mode Wi-Fi/Bluetooth coexistence scheme
- Wi-Fi and Bluetooth over USB
- Bluetooth over UART
- External SPI flash support enables auto installation over USB interface

WLAN

- IEEE 802.11 a/b/g/n compliant
- Support 20MHz, 40MHz in 5GHz band, and 20MHz, 40MHz bandwidth in 2.4GHz band
- Dual-band 2T2R mode with data rate up to 300Mbps
- Support STBC, LDPC, MRC, and transmit Beamforming
- Greenfield, mixed mode, legacy modes support
- Frame aggregation
- Integrated LNA, PA, and T/R switch
- Optional external LNA and PA support.
- IEEE 802.11 d/e/h/i/k/r/w support
- Security support for WFA WPA/WPA2 personal, WPS2.0, WAPI
- Supports 802.11w protected managed frames
- QoS support of WFA WMM, WMM PS
- 802.11 to 802.3 header translation offload
- Supports Wi-Fi Direct
- Per packet transmit power control
- Wake on WLAN

- specification
- Buffered clock output for co-clock with other SOC chipset
- Integrate EFUSE to eliminate the requirement for external EEPROM
- External serial flash support
- 17 programmable general purpose Input / Output
- 2 configurable LED pins
- Internal thermal sensor for temperature compensation and thermal protection.
- Self calibration
- Standard HCI interface over USB super-speed, high-speed and full-speed mode
- High speed UART up to 4Mbps BAUD rate
- Integrated BALUN and PA with 9dBm transmit power
- Best-in-class BT/Wi-Fi coexistence performance
- Scatternet support: Up to 4 piconets simultaneously with background inquiry/page scan
- Up to 4 simultaneous active ACL links
- Support SCO and eSCO link with re-transmission
- Support wide-band speech and hardware accelerated SBC codec for A2DP streaming
- Packet loss concealment
- Channel quality driven data rate adaptation
- Channel assessment for AFH
- 3DD support
- Wake on Bluetooth

Applications

T7632U is designed for a compact PCB design for USB interface. It is suitable for the following applications.

- Laptop NB
- Tablet/MID
- USB dongle
- DTV

BLUETOOTH <ul style="list-style-type: none"> ■ Bluetooth specification v2.1+EDR ■ Bluetooth v4.0 Low Energy (LE) 	<ul style="list-style-type: none"> ■ BDP
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3.General Specification

Model	WL-UM01WBS-7632-V1.0
Product Name	WLAN 11a/b/g/n USB2.0 module
Major Chipset	MT7632U
Standard	WIFI: IEEE802.11a/b/g/n/d/e/h/i/k/r/w BT : V4.0
Data Transfer Rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,60,90,120 and maximum of 3000Mbps
Modulation Method	DQPSK, CCK and OFDM (BPSK/QPSK)
Frequency Band	2.4GHz /5 GHz
OS Support	Windows 2000,XP32-64,Vista 32/64,Win7 32/64,Linux,Mac, Android, WIN CE
Security	64-bit WEP (WEP-40) and 128-bit WEP (WEP-104) encryption with hardware TKIP and CKIP processing AES-CCMP hardware processing SMS4-WPI (WAPI) hardware processing
Bus Interface	WiFi: USB2.0 BT: USB
Operating Channel	WiFi 2.4GHz: United States : 11: (Ch. 1-11); Europe : 13: (Ch. 1-13) ; Japan : 14: (Ch. 1-14) BT 2.4GHz: Ch. 0 ~78
Power Consumption	3.3 V ±0.2V I/O supply voltage
Operating Temperature	-10 ~ +70° C ambient temperature
Storage Temperature	-10 ~ 70°C ambient temperature
Humidity	5 to 90 % maximum (non-condensing)
Dimension	27.0 x 17.85 x 1.6mm (LxWxH) +-0.2MM

4. Block Diagram

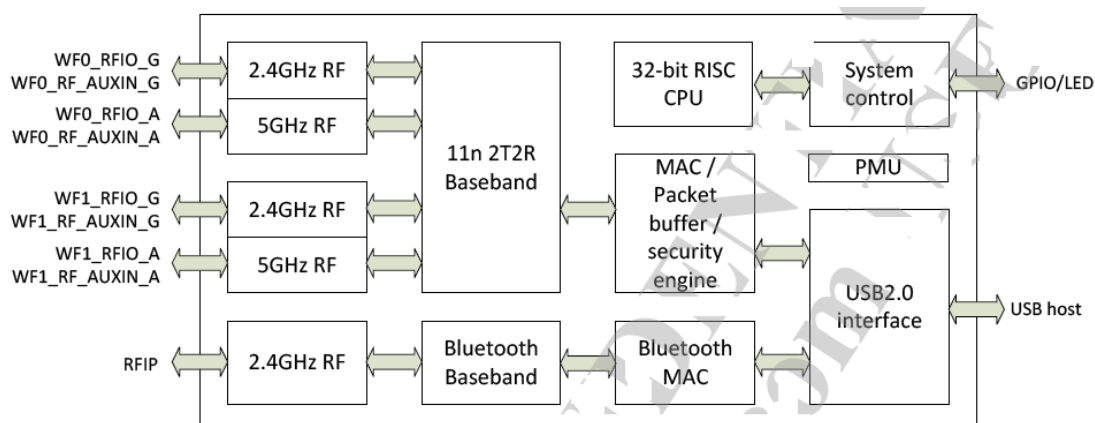


Figure 1 MT7632U block diagram

5. Power Supply DC Characteristics

PARAMETER	CONDITIONS	PERFORMANCE			
		MIN	TYP	MAX	Unit
Switching regulator					
Input voltage		2.97	3.3	3.63	V
Output voltage	Default voltage setting in the programmable range1				
Output current		-	-	800	mA
Quiescent current		-	40	55	uA
Line regulation	3.63V input voltage range @ no load	-	-	1	%
Load regulation	1mA to 800mA load current	-	-	0.05	mV/ mA
Efficiency	600mA to 700mA load current	-	85	-	%
Over-current Shutdown	Threshold	-	960	-	mA
Digital LDO					
Input voltage		1.5	1.6	1.8	V
Output voltage		1.08	1.2	1.32	V
Output current		-	-	650	mA
Quiescent current	No load	-	10	-	uA

DC Characteristics

Module	Voltage	Current Consumption (linking)
WL-UM01WBS-7632-V1.0	3.3V	

6. Electrical Specifications

1) RF Characteristics for IEEE802.11b (11Mbps mode unless otherwise specified)

Items	Contents			
Specification	IEEE802.11b			
Mode	CCK 11 Mbps			
Channel frequency	2412 ~ 2484 MHz			
RX (per \leq 85 dBm@8%)	-85 dBm			
Freq Err Limit	\pm 13ppm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (17 \pm 2 dBm)		17		dBm
EVM (\leq -18)		-18		dB

2) RF Characteristics for IEEE802.11g (54Mbps mode unless otherwise specified)

Items	Contents			
Specification	IEEE802.11g			
Mode	OFDM 54 Mbps			
Channel frequency	2412 ~ 2484 MHz			
RX (per \leq 70 dBm@10%)	-70 dBm			
Freq Err Limit	\pm 13ppm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (14 \pm 2dBm)		14		dBm
EVM (\leq -27)		-27		dB

3) RF Characteristics for IEEE802.11n (BW20_MCS7)

Items	Contents			
Specification	IEEE802.11n (BW20_MCS7)			
Mode	BW20_MCS7 65 Mbps			
Channel frequency	2412 ~ 2484 MHz			
RX (per \leq 65 dBm@10%)	-65 dBm			
Freq Err Limit	\pm 13ppm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (13 \pm 2 dBm)		13		dBm
EVM (\leq -28)		-28		dB

4) RF Characteristics for IEEE802.11n (BW40_MCS7)

Items	Contents			
Specification	IEEE802.11n (BW40_MCS7)			
Mode	BW40_MCS7 135 Mbps			
Channel frequency	2412 ~ 2484 MHz			
RX (per \leq 65 dBm@10%)	-65 dBm			
Freq Err Limit	\pm 13ppm			

TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (13±2 dBm)		13		dBm
EVM (≤-28)		-28		dB

4) RF Characteristics for 5G (Data Rate 54M OFDM)

Items	Contents			
Specification	5G (Data Rate 54M OFDM)			
Mode	54 Mbps			
Channel frequency	5180 ~ 5825 MHz			
RX (per≤65 dBm@10%)	-65 dBm			
Freq Err Limit	±5ppm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (12±2 dBm)		12		dBm
EVM (≤-28)		-28		dB

5) RF Characteristics for 5G (HT20_MCS7)

Items	Contents			
Specification	5G (HT20_MCS7)			
Mode	65 Mbps			
Channel frequency	5180 ~ 5825 MHz			
RX (per≤65 dBm@10%)	-65 dBm			
Freq Err Limit	±5ppm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (11±2 dBm)		12		dBm
EVM (≤-28)		-28		dB

6) RF Characteristics for 5G (HT40_MCS7)

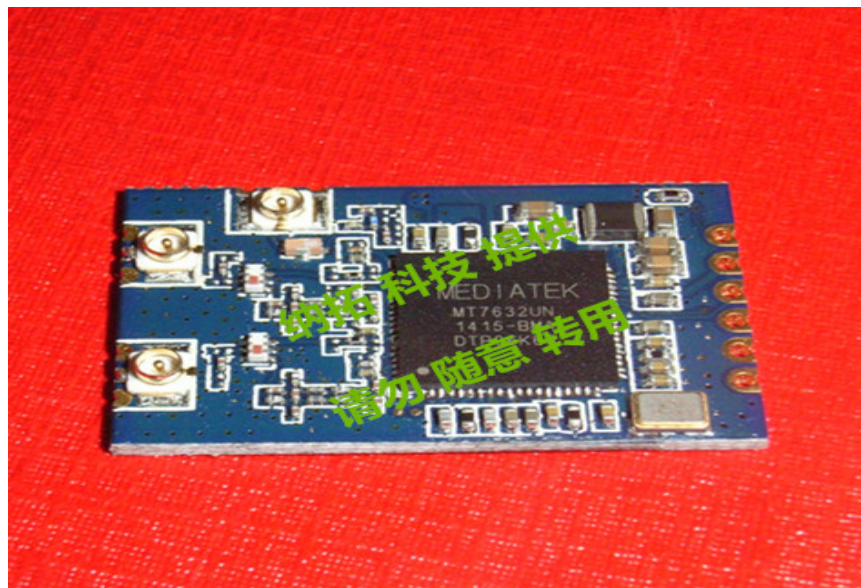
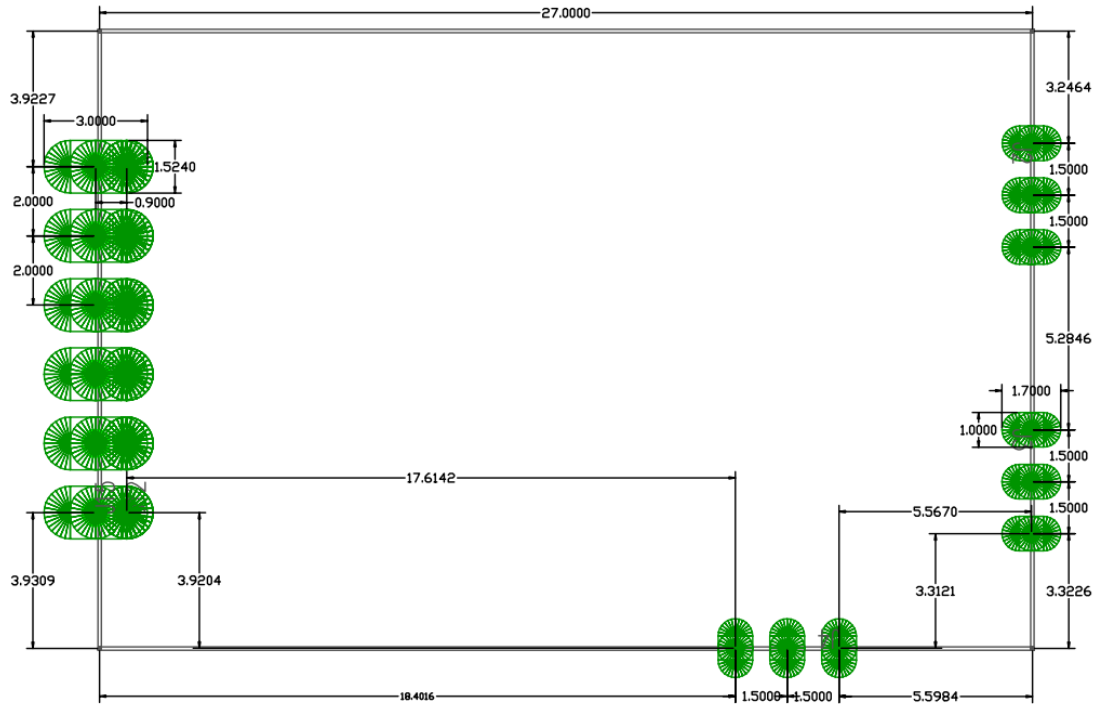
Items	Contents			
Specification	5G (HT40_MCS7)			
Mode	135 Mbps			
Channel frequency	5180 ~ 5825 MHz			
RX (per≤65 dBm@10%)	-65 dBm			
Freq Err Limit	±5ppm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (11±2 dBm)		12		dBm
EVM (≤-28)		-28		dB

7. Bluetooth Specification

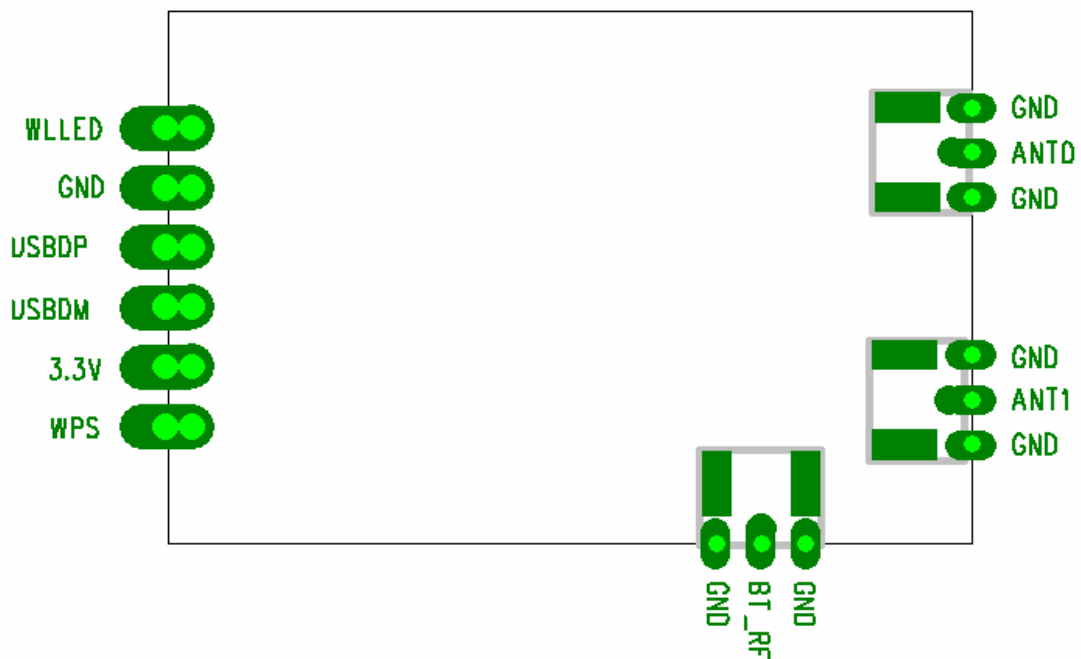
Feature	Description		
General Specification			
Bluetooth Standard	Bluetooth V3.3 of 1, 2 and 3 Mbps.		
Host Interface	UART		
Antenna Reference	Small antennas with 0~2 dBi peak gain		
Frequency Band	2.400 GHz ~ 2483.5 GHz		
Number of Channels	79 channels		
Modulation	FHSS, GFSK, DPSK, DQPSK		
RF Specification			
	Min	Typical	Max
Output Power (Class 1.5)		10	
Output Power (Class 2)		2	
Sensitivity @ BER=0.1% for GFSK (1Mbps)		-89	
Sensitivity @ BER=0.01% for $\pi/4$ -DQPSK (2Mbps)		-85	
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)		-83	
Maximum Input Level	GFSK (1Mbps):-20dBm		
	$\pi/4$ -DQPSK (2Mbps) :-20dBm		
	8DPSK (3Mbps) :-20dBm		

7.Mechanical

Dimensions (mm)	Length	Width	Height
		27.0 (Tolerance:±0.2mm)	17.85 (Tolerance:±0.2mm)

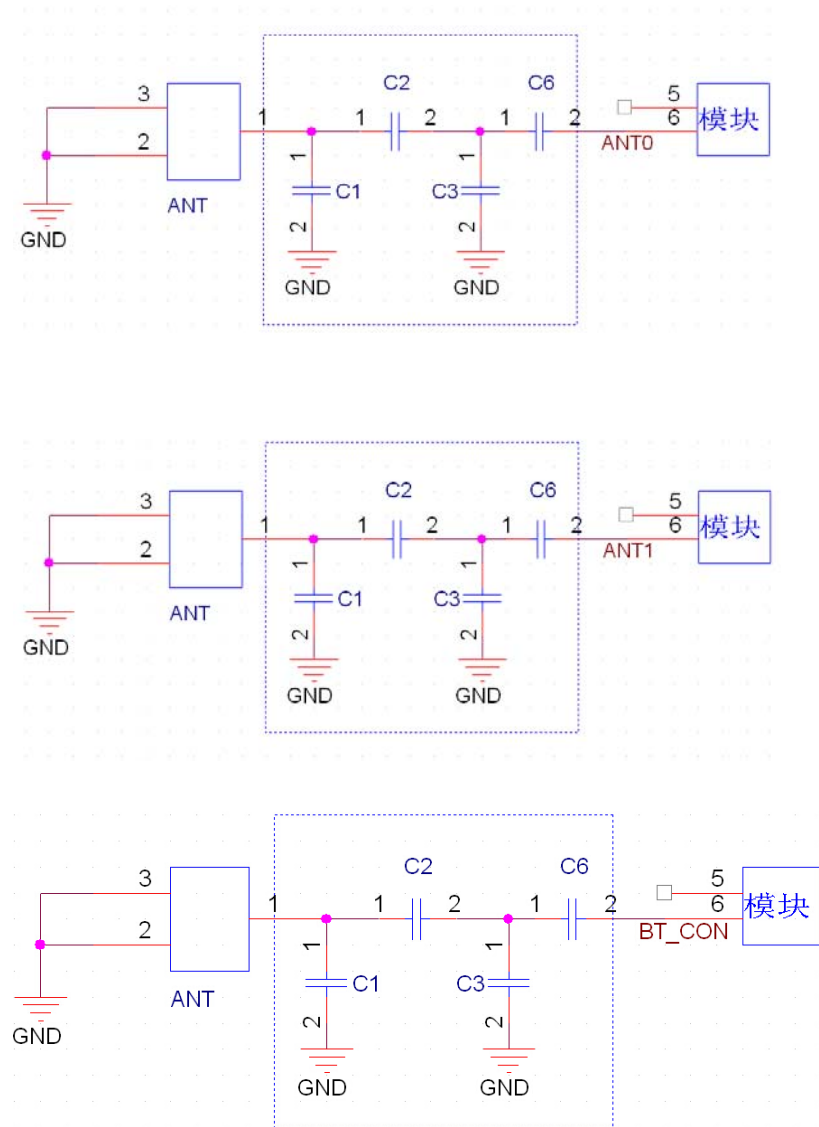


8.Module Pin Assignment



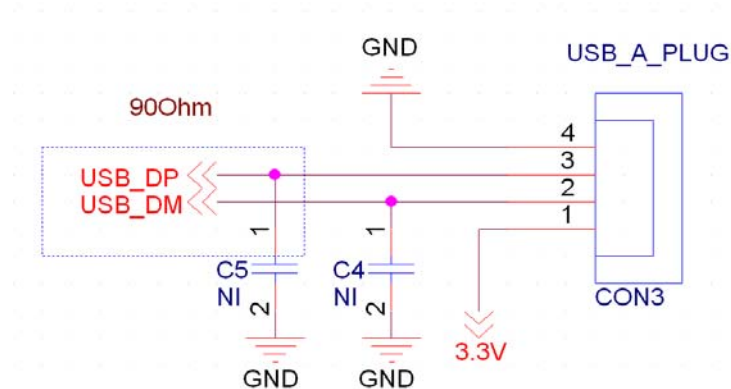
Pin	Function	Description
1	WLLLED	Programmable open-drain LED controller
2	GND	Ground
3	USBDP	High-Speed USB D+ Signal
4	USBDM	High-Speed USB D- Signal
5	3.3V	VDD3.3V for Digital IO
6	WPS	GPIO
7	GND	Ground
8	ANT0	RF a-band RF port
9	GND	Ground
10	GND	Ground
11	ANT1	RF a-band RF port
12	GND	Ground
13	GND	Ground
14	BT_RF	RF Bluetooth port
15	GND	Ground

9.1.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元件参数为准.
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.

9.2. 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

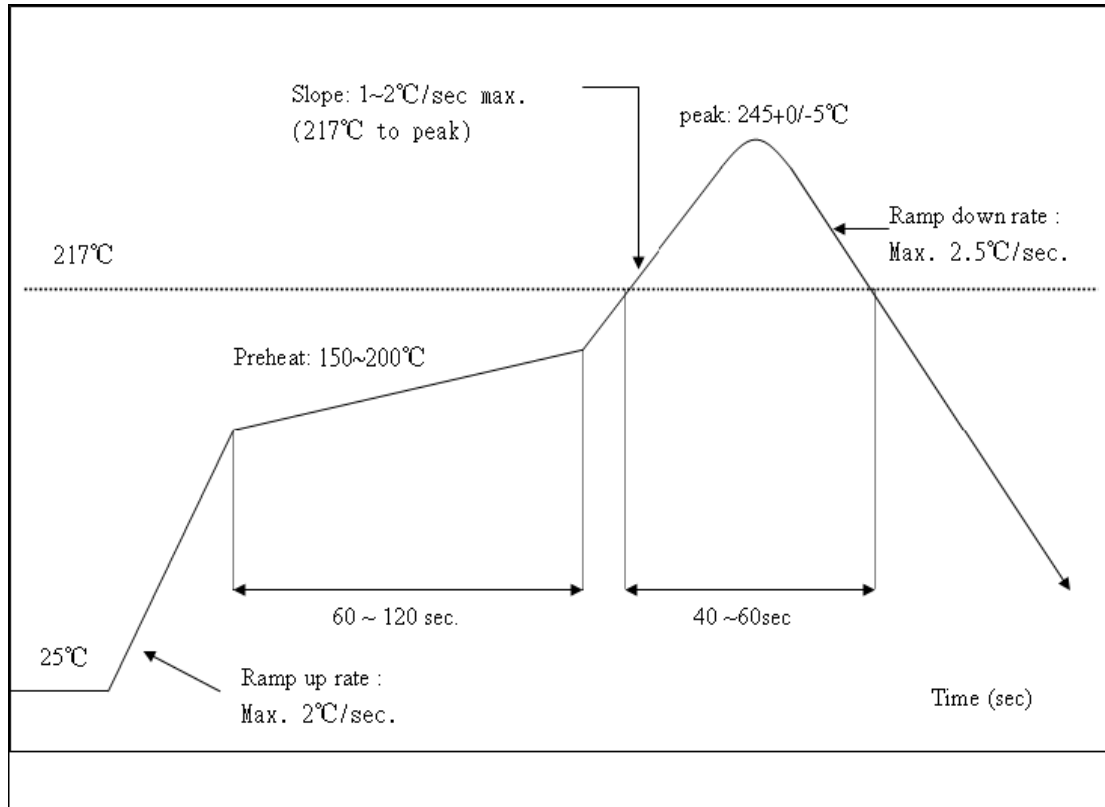
2.Suggested that leave a power switch power supply input terminal ,every tim a electric power is on

10. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <math><250^{\circ}\text{C}</math>

Number of Times : ≤ 2 times



ENVIRONMENTAL

Operating

Operating Temperature: 0°C to +70 °C

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

Storage

Temperature: -40°C to +80°C (non-operating)

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

MTBF caculation

Over 150,000hours