

AIC8800D40L

产品规格书

规格：12*12*2.3mm 44PIN

版本：V1.0

页数：18页

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Revision History

[illegible]

1 . General Description

1.1 Introduction

Mstlink would like to announce a low- cost and low- power consumption module which has the Wi-Fi6(2.4G 802.11a/b/g/n/ac/ax+5G 802.11a/n/ac/ax) and BLE 5.4 functionalities.

Its WLAN function supports the SDIO 3 . 0 interface, and BT only supports UART interface . The module provides simple legacy and 2 0 MHz/ 4 0 MHz co- existence mechanism to ensure backward and network compatibility.

The data rates up to 286.8Mbps with 20/40MHz bandwidth

1.2 Description

Model Name	AIC8800D40L
Product Description	Support Wi- Fi / BT functionalities
Dimension	L x W x H: 12 x 12 mm
Wi- Fi Interface	Support SDIO 3.0
OS supported	Android / Linux/ Win CE / iOS
Operating temperature	-20°C to 80°C
Storage temperature	-40°C to 85°C

2. Features

General

- Compliant with IEEE 802.11a/b/g/n/ac/ax
- support 2.4 G+5 G dual band, 20/40MHz bandwidth
- Wi-Fi Security WEP / WPA / WPA2/ WPA3- SAE Personal, MFP
- Support STA, SoftAP, Wi-Fi Direct modes concurrently
- Support STBC, beamforming
- Support Wi-Fi 6 TWT

PHY Features

- The data rates up to 286.8Mbps with 20/40MHz bandwidth

Host Interface

- Support, SDIO 3.0 , UART or USB2.0
- Supports WLAN- Bluetooth coexistence

3 . Block Diagram

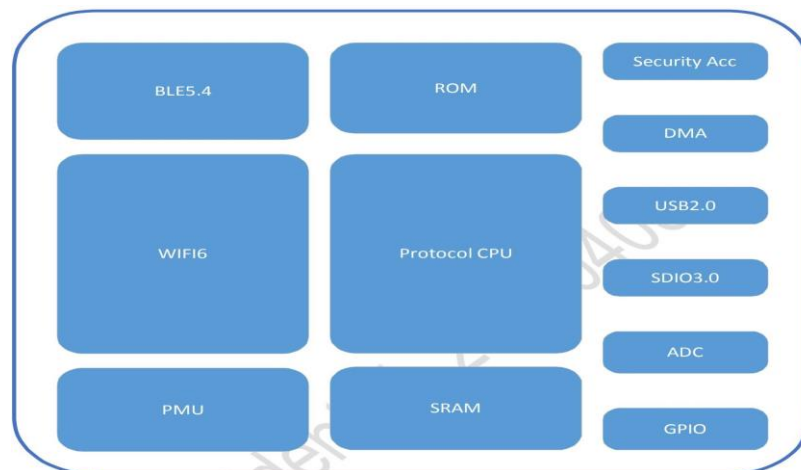


Figure2-1 AIC8800D40L Block Diagram

4.General Specification

4.1 2.4GHz RF Specification

Feature	Description	
WLAN Standard	IEEE 802.11b/g/n/ac/ax, Wi-Fi compliant	
Frequency Range	2.400 GHz ~ 2.497 GHz (2.4 GHz ISM Band)	
Number of Channels	2.4GHz: Ch 1 ~ Ch 13, Ch 14	
Modulation	DBPSK/ DQPSK/ CCK(DSSS) 、 BPSK/ QPSK/ 16 QAM/ 64 QAM(OFDM)	
Test Items	Typical Value	EVM
Output Power	802.11b /11Mbps : 18dBm \pm 2 dB	EVM \leq - 10dB
	802.11g /54Mbps : 15dBm \pm 2 dB	EVM \leq - 25 dB
	802.11n /MCS7 : 14dBm \pm 2 dB	EVM \leq - 28 dB
	802.11ax /MCS9 : 13 \pm 2 dBm	EVM \leq - 32 dB
	802.11ax /MCS11 : 13 \pm 2 dBm	EVM \leq - 35 dB
	Tx power control by driver userconfig file. recommended power index setting as below: [0] =8 (ofdm1lowrate) [1] =8 (ofdm64qam) [2] =8 (ofdm256qam) [3] =8 (ofdm1024qam) [4] =7 (dsss) //建议改 level7 功率 16dbm 符合 CE 认证标准. MCS10, MCS11 仅支持 TX 不支持 RX,模组协商模式最高支持 MCS9 . MCS10 , 11 功率为保证 EVM 可能被限制低于目标功率为正常现象。	
Spectrum Mask	Meet with IEEE standard	
Freq. Tolerance	\pm 20ppm	
Receive Sensitivity (11b,20MHz) @8% PER	- 11Mbps \leq -85dBm	\leq -76dBm
Receive Sensitivity (11g,20MHz) @ 10% PER	- 54Mbps \leq -73dBm	\leq -68dBm
Receive Sensitivity (11n,20MHz) @ 10% PER	- MCS=7 \leq -70dBm	\leq -67dBm
Receive Sensitivity (11n,40MHz) @ 10% PER	- MCS=7 \leq -68dBm	\leq -64dBm
Receive Sensitivity (11ac,20 MHz) @ 10% PER	- MCS=8 \leq -67dBm	\leq -59dBm
Receive Sensitivity	- MCS=9 \leq -63dBm	\leq -54dBm

(11ac,40MHz) @ 10% PER		
Receive Sensitivity (11 ax,20MHz) @ 10% PER	- MCS=9 \leq -65dBm	\leq -57dBm
Receive Sensitivity (11 ax,40MHz) @ 10% PER	- MCS=9 \leq -62dBm	\leq -54dBm
Maximum Input Level	802. 11b : - 10 dBm	
	802. 11g/n : -20 dBm	
Antenna Reference	Small antennas with 0 ~ 2 dBi peak gain	

4.2 WI-FI 5GHz Specification

Feature	Description		
WLAN Standard	IEEE 802 . 11a/n/ac/ax, Wi-Fi compliant		
Frequency Range	5 . 150 GHz ~ 5.850 GHz (5.0 GHz Band)		
Number of Channels	5 . 0GHz: Please see the table1		
Test Items	Typical Value		EVM
Output Power	802. 11a 54Mbps: 15 ± 2 dBm		EVM ≤ - 25 dB
	802. 11n MCS7: 14± 2 dBm		EVM ≤ - 28 dB
	802. 11ac MCS8: 14 ± 2 dBm		EVM ≤ - 30 dB
	802. 11ac MCS9: 13± 2 dBm		EVM ≤ - 32 dB
	802. 11ax MCS11 : 13 ± 2 dBm		EVM ≤ - 35 dB
	Tx power control by driver userconfig file. Power index setting as below: [0]=8 (ofdm1lowrate) 11dbm [1] =7 (ofdm64qam) [2] =7 (ofdm256qam) [3] =7 (ofdm1024qam) MCS1 0 , MCS11 only TX is supported and RX is not supported. And TX power may limited by the driver, not meet above listed spec.		
Receive Sensitivity (11a,20MHz) @ 10% PER	- 6Mbps PER @ -89 dBm, typical	≤ -85	
	- 54Mbps PER @ -71 dBm, typical	≤ -68	
Receive Sensitivity (11n,20MHz) @ 10% PER	- MCS=0 PER @ -89 dBm, typical	≤ -85	
	- MCS=7 PER @ -69 dBm, typical	≤ -67	
Receive Sensitivity (11n,40MHz) @ 10% PER	- MCS=0 PER @ -87 dBm, typical	≤ -82	
	- MCS=7 PER @ -67 dBm, typical	≤ -64	
Receive Sensitivity (11ac,20MHz) @ 10% PER	- MCS=0 PER @ -85 dBm, typical	≤ -81	
	- MCS=8 PER @ -66 dBm, typical	≤ -59	
Receive Sensitivity	- MCS=0 PER @ -83 dBm, typical	≤ -79	

(11ac,40MHz) @ 10% PER	- MCS=9	PER @ -63 dBm, typical	≤ -54
Receive Sensitivity (11ax,20MHz) @ 10% PER	- MCS=0	PER @ -82 dBm, typical	≤ -78
	- MCS= 11	PER @ -65 dBm, typical	≤ -57
Receive Sensitivity (11ax,40MHz) @ 10% PER	- MCS=0	PER @ -81 dBm, typical	≤ -78
	- MCS= 11	PER @ -62 dBm, typical	≤ -54
Maximum input level	802. 11a/n: -30 dBm		
	802. 11ac: -30 dBm		
	802. 11ax: -30 dBm		
Antenna Reference	Small antennas with 0 ~ 2 dBi peak gain		
Conditions : VBAT=3 .3 V ; VDDIO=3.3 V ; Temp:25°C			
¹ 5 GHz(20 MHz) Channel table			
Band range	Operating Channel Numbers		Channel center frequencies(MHz)
5180 MHz~5240 MHz	36		5180
	40		5200
	44		5220
	48		5240
5260 MHz~5320 MHz	52		5260
	56		5280
	60		5300
	64		5320
5550 MHz~5700 MHz	100		5500
	104		5520
	108		5540
	112		5560
	116		5580
	120		5600
	124		5620
	128		5640
	132		5660
	136		5680
	140		5700
5745 MHz~5825 MHz	149		5745
	153		5765
	157		5785
	161		5805
	165		5805

4.3 Bluetooth Specification

Feature	Description		
General Specification			
Bluetooth Standard	BLE V5 . 4		
Host Interface	UART		
Antenna Reference	Small antennas with 0 ~ 2 dBi peak gain		
Frequency Band	2402 MHz ~ 2480 MHz		
Number of Channels	7 9 channels		
Modulation	GFSK, π /4-DQPSK, 8-DPSK		
RF Specification			
	Min(dBm)	Typical(dBm)	Max(dBm)
Output Power (Class 1)	-3	5	8
Sensitivity @ BER=0. 1% for GFSK (1Mbps)			-70
Sensitivity @ BER=0 .01% for π /4 -DQPSK (2Mbps)			-70
Sensitivity @ BER=0 .01% for 8 DPSK (3 Mbps)			-70
Maximum Input Level	GFSK (1Mbps) :-20dBm		
	π /4-DQPSK (2 Mbps) :-20dBm		
	8 DPSK (3 Mbps) :- 20 dBm		

5 . ID setting information

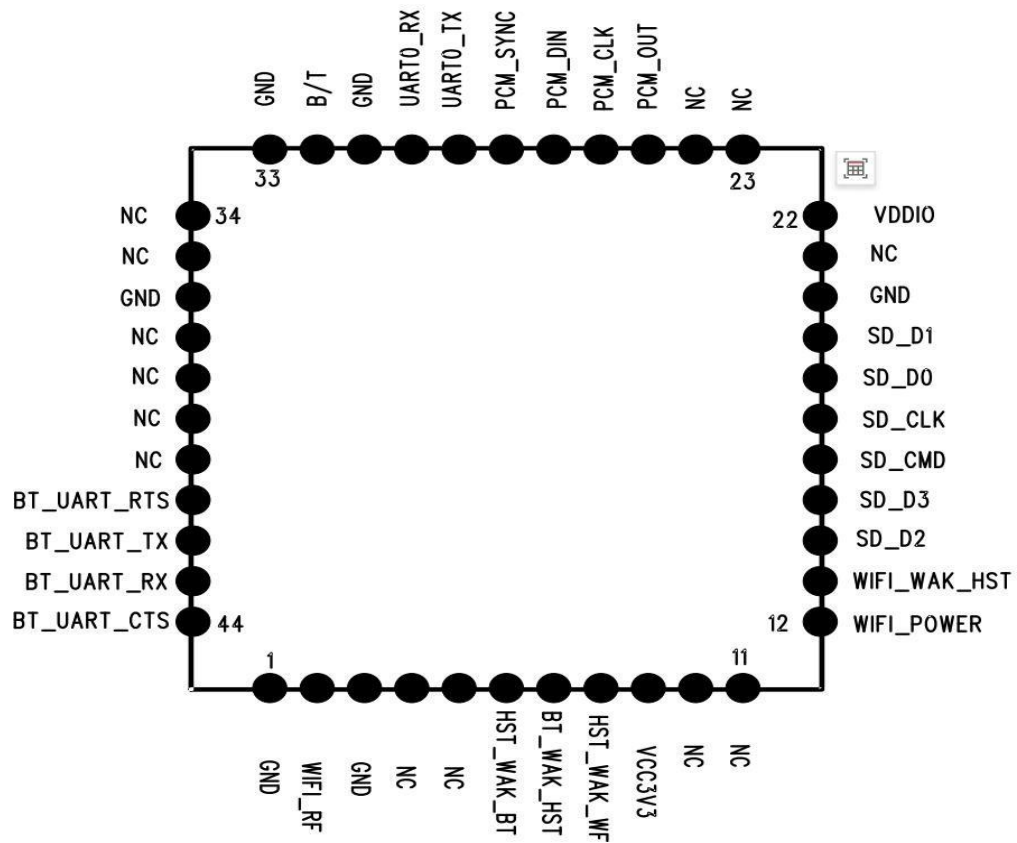
WI- FI

Vendor ID	TBD
Product ID	TBD

6 . Pin Definition

6.1 Pin Outline

< TOP VIEW >



6.2 Pin Definition details

NO.	Name	Type	Description	Voltage
1	GND	—	Ground connections	
2	WL/ BT_ ANT	I/O	WLAN and BT RF I/ O port	
3	GND	—	Ground connections	
4	NC	—	Floating (Don' t connected to ground)	
5	NC	—	Floating (Don' t connected to ground)	

6	HST_WAK_BT	I/O	HOST_WAKE_BT	VIO
7	BT_WAK_HST	I/O	BT_WAKE_HOST	VIO
8	HST_WAK_WF	I/O	HOST_WAKE_WIFI	
9	VCC3V3	P	Main power voltage source input	3.3V
10	NC	—	Floating (Don' t connected to ground)	
11	NC	—	Floating (Don' t connected to ground)	
12	WIFI_POWER	I	Default Power Enable : pull high Power Disable : pull low	3.3V
13	WIFI_WAK_HOST	I/O	WiFi Wake Up Host	
14	SD_D2	I/O	SDIO data line 2	VIO
15	SD_D3	I/O	SDIO data line 3	VIO
16	SD_CMD	I/O	SDIO command line	VIO
17	SD_CLK	I/O	SDIO clock line	VIO
18	SD_D0	I/O	SDIO data line 0	VIO
19	SD_D1	I/O	SDIO data line 1	VIO
20	GND	—	Ground connections	
21	NC	—	Floating (Don' t connected to ground)	
22	VDDIO	P	I/O Voltage	1.8V/3.3V
23	NC	—	Floating (Don' t connected to ground)	
24	NC	—	Floating (Don' t connected to ground)	
25	PCM_OUT	I/O	PCM data Out	
26	PCM_CLK	I/O	PCM Clock	
27	PCM_DIN	I/O	PCM data Input	
28	PCM_SYNC	I/O	PCM Synchronization control	
29	UART0_TX	I/O	UART0 TX(DEBUG)	
30	UART0_RX	I/O	UART0 RX(DEBUG)	
31	GND	—	Ground connections	
32	B/T	I/O	NC (u s e d w i t h d u a l a n t e n n a s)	
33	GND	—	Ground connections	
34	NC	—	Floating (Don' t connected to ground)	
35	NC	—	Floating (Don' t connected to ground)	
36	GND	—	Ground connections	
37	NC	—	Floating (Don' t connected to ground)	
38	NC	—	Floating (Don' t connected to ground)	
39	NC	—	Floating (Don' t connected to ground)	
40	NC	—	Floating (Don' t connected to ground)	
41	UART1_RTS	I/O	UART1_RTS,	VIO
42	UART1_TX	I/O	UART1_TX	VIO
43	UART1_RX	I/O	UART1_RX	VIO
44	UART1_CTS	I/O	UART1_CTS	VIO

P:POWER I:INPUT O:OUTPUT

7 . Electrical Specifications

7.1 Power Supply DC Characteristics

The digital IO supports VDD33 or VDD18 application.

	MIN	TYP	MAX	Unit
Operating Temperature	-20	25	80	deg. C
VBAT	3	3.3	3.6	V
VDDIO	1.7	1.8/3.3	3.6	V

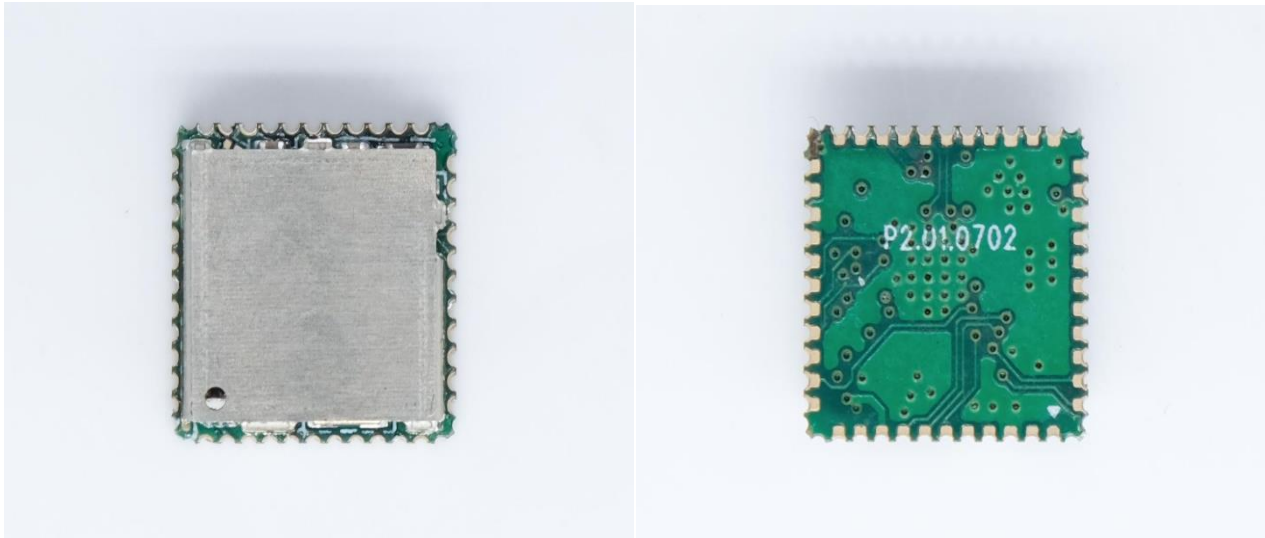
7.2 Power Consumption

	Test condition: VBAT=3 .3 V / VDDIO=3 .3 V	
	Current @ TX	Current @ RX
	Maximum(mA)	Maximum(mA)
11b@20dbm	239	39.5
11g@ 14dbm	157	39.2
HT20- mcs7@ 14dbm	158. 1	39.3
HT40- mcs7@ 14dbm	145.8	39.6
VHT20- mcs8@ 14 dbm	153.4	39.3
VHT40- mcs9@ 14 dbm	143. 1	39.6
HE20- mcs9@ 14dbm	149.9	39.2
HE40- mcs9@ 14dbm	139.9	39.7
HE20- mcs11 @ 14 dbm	148.8	/
HE40- mcs11 @ 14 dbm	139.9	/
BT	31.8	39

8 . Size reference

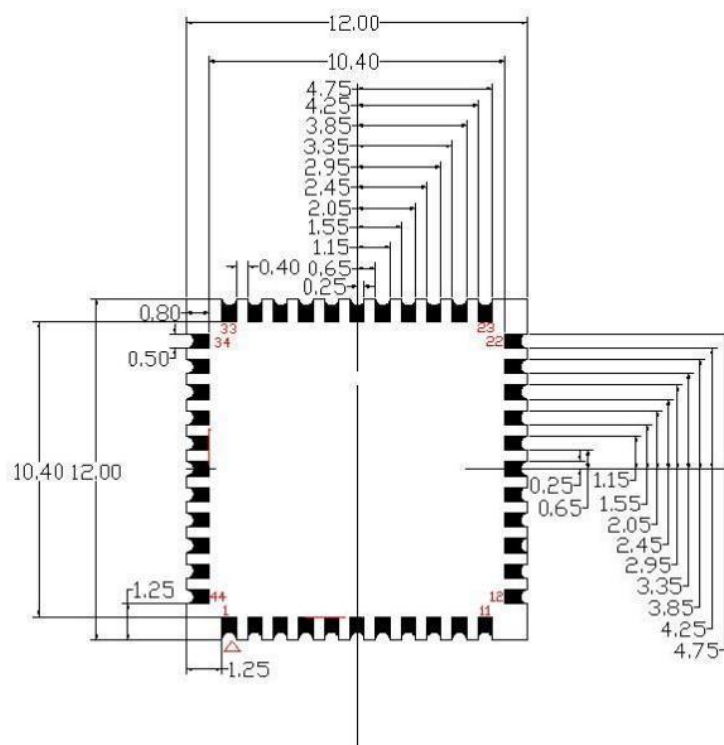
8.1 Module Picture

L x W : 12 x 12 (+/-0.1) mm



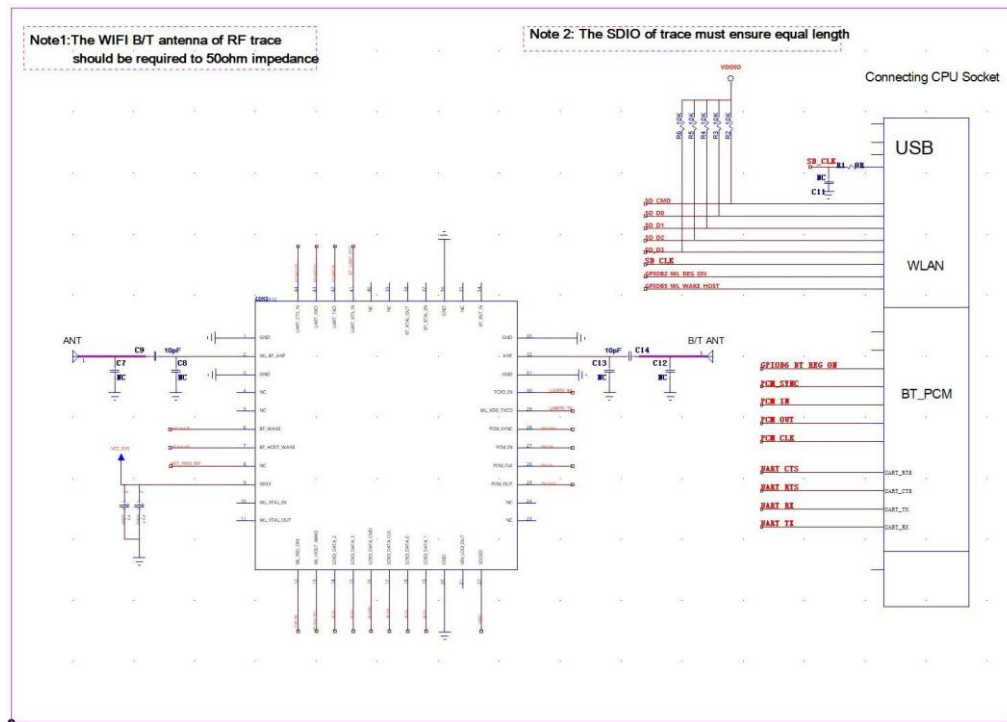
8.2 Physical Dimensions

<TOP View>



9. Reference Design

Note: Module requires independent power supply , supply capacity ≥ 350 mA and ripple less than 100 mV; Do not share power with amplifier, infrared device, camera, etc.



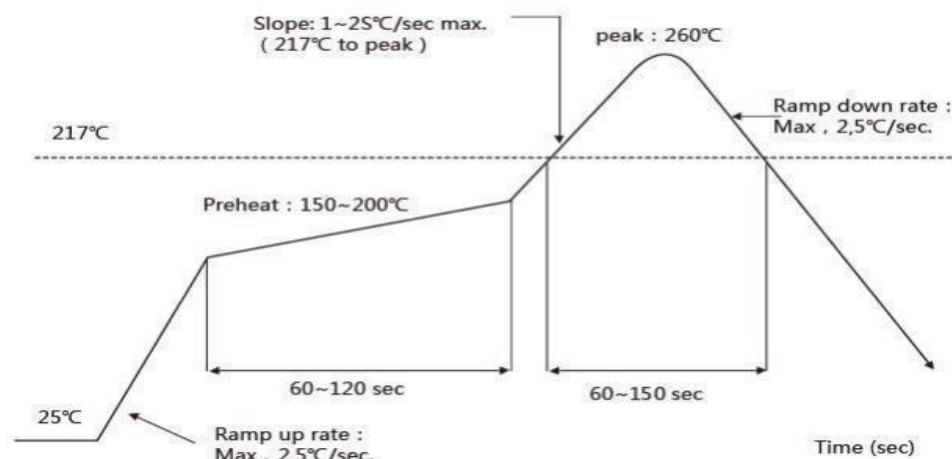
10 . Recommended Reflow Profile

Referred to IPC/ JEDEC standard.

Peak Temperature: $\leq 260^{\circ}\text{C}$

Time within 5°C of peak temperature: $\geq 10\text{s}$

Number of Times: ≤ 2 times



11. RoHS compliance

All hardware components are fully compliant with EU RoHS directive

12. Packing information

Tray color: Blue

Vaccum packing, desiccant inside, 6 color humidity card

Packing will be executed according to customer's requirement if not otherwise specified



12.1 Carrier Tape Detail

