

BL-M7682ST4

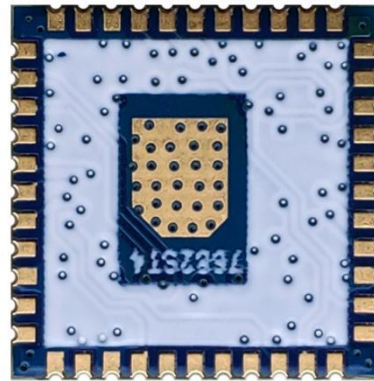
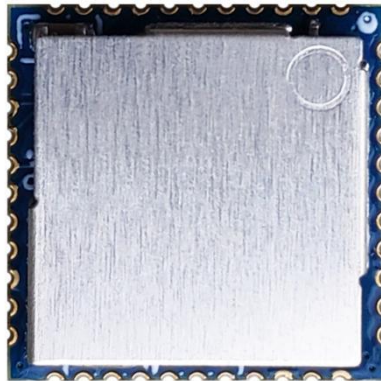
802.11n 150Mbps WLAN

UART IOT Module Specification

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Module Name: BL-M7682ST4	
Module Type: 802.11b/g/n 150Mbps WLAN UART IOT Module	
Revision: V1.0	
Customer Approval:	
Company:	
Title:	
Signature:	Date:
BL-link Approval:	
Title:	
Signature:	Date:

Revision History

Revision	Summary	Release Date
1.0	Internal release	2020-10-30

1. Introduction

BL-M7682ST4 is a highly integrated module featuring an application processor, a low power 1x1 11n single-band Wi-Fi subsystem and a power management unit.

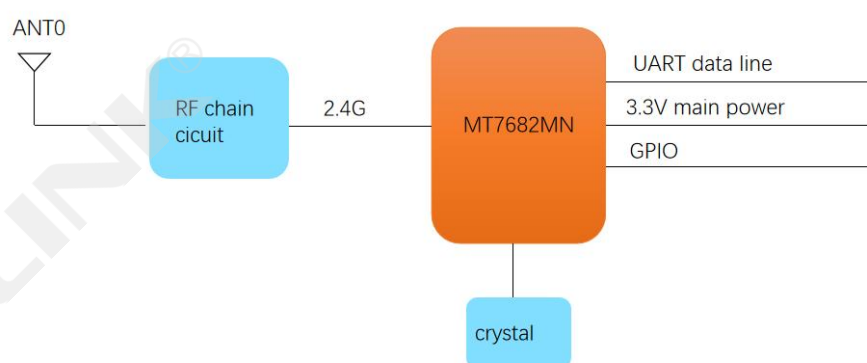
BL-M7682ST4 include integrated with 1MB flash memory, and supports interfaces including UART, I2C, SPI, I2S, PWM, SDIO and ADC.

The Wi-Fi subsystem contains the 802.11b/g/n radio, baseband and MAC that are designed to meet low power and high throughput application requirements. It also contains a 32-bit RISC CPU that could fully offload the application processor.

Features

- Operating Frequencies: 2.4~2.4835GHz
- IEEE Standards: IEEE 802.11b/g/n
- Wireless data rate can reach up to 150Mbps
- Connect to external antenna through half hole pads
- Power Supply: 3.3V±0.2V main power supply

Block Diagram

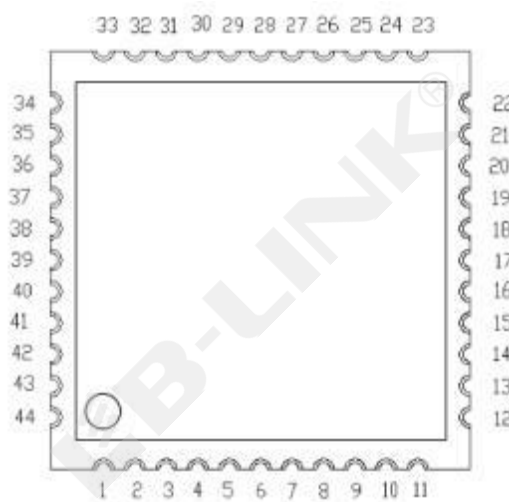


General Specifications

Module Name	BL-M7682ST4 WLAN UART IOT Module
Chipset	MT7682MN

WLAN Standards	IEEE 802.11b/g/n
Host Interface	UART
Antenna	Connect to the external antenna through half hole pads
Dimension	12*12*2.3mm (L*W*H)
Power Supply	VDD 3.3V±0.2V @ 500 mA (Max)
Operation Temperature	-20°C to +70°C
Operation Humidity	10% to 95% RH (Non-Condensing)
ESD	3kv

2. Pin Assignments



Top view

Pin Definition

No	Pin Name	Type	Description	Supply
1	GND	RF	Ground	
2	ANT	RF	RF signal port	
3	GND	RF	Ground	
4	GPIO17	I/O	SPI Slave (1) SPI Master (1) I2S Master/Slave PWM (5)	VDDIO

			CLKO3 AUXADC0 BT_PRI0	
5	GPIO15	I/O	SPI Slave (1) SPI Master (1) I2S Master/Slave SDIO Master SDIO Slave I2C (1) PWM (3)	VDDIO
6	NC	/	Not connect	
7	NC	/	Not connect	
8	GPIO13	I/O	SPI Slave (1) SPI Master (1) UART (2) SDIO Master SDIO Slave CLKO4 I2S Master/Slave	VDDIO
9	VDD33	P	Main power supply	
10	NC	/	Not connect	
11	NC	/	Not connect	
12	CHIP_EN	I	Chip enable	VRTC
13	GPIO11	I/O	PWM (3) UART (2) SDIO Master SDIO Slave CLKO2 External frontend support I2S Master/Slave	VDDIO
14	GPIO16	I/O	SPI Slave (1) SPI Master (1) I2S Master/Slave SDIO Master SDIO Slave I2C (1)	VDDIO
15	GPIO14	I/O	SPI Slave (1) SPI Master (1) I2S Master/Slave SDIO Master	VDDIO

			SDIO Slave PWM (4) CLKO4	
16	32K_IN	I/O	Input pin for 32K crystal	VRTC
17	32K_OUT	I/O	Input pin for 32K crystal	VRTC
18	RTC_EINT	I/O	Dedicate EINT input in RTC	VRTC
19	VRTC	P	RTC domain power supply	
20	GND	P	Ground	
21	GPIO12	I/O	SPI Slave (1) SPI Master (1) UART (2) SDIO Master SDIO Slave External frontend support	VDDIO
22	VDDIO	P	GPIO signal pins power supply	
23	NC	/	Not connect	
24	EXT_PWR_EN	O	PMU enable	VRTC
25	GPIO4	I/O	SPI Slave (0) SPI Master (0) Cortex-M4JTAG External frontend support	VDDIO
26	NC	/	Not connect	
27	NC	/	Not connect	
28	NC	/	Not connect	
29	NC	/	Not connect	
30	GPIO2	I/O	UART (1) PWM (0) I2S Master/Slave Cortex-M4JTAG CLKO0 BT_PRI0 External frontend support	VDDIO
31	GND	P	Ground	
32	NC	/	Not connect	
33	GND	P	Ground	
34	NC	/	Not connect	
35	NC	/	Not connect	

36	GND	P	Ground	
37	NC	/	Not connect	
38	GPIO3	I/O	UART (1) PWM (1) I2S Master/Slave CM4 JTAG External frontend support	VDDIO
39	GPIO1	I/O	UART (1) I2C (1) I2S Master/Slave Cortex-M4 JTAG External frontend support BT_PRI3 PWM (1)	VDDIO
40	GPIO0	I/O	UART (1) I2C (1) I2S Master/Slave CM4 JTAG External frontend support BT_PRI1 PWM (0)	VDDIO
41	NC	/	Not connect	
42	GPIO22	I/O	UART (0) Module use UART (0) TX function	VDDIO
43	GPIO21	I/O	UART (0) I2C (1) PWM (5) Module use UART (0) RX function	VDDIO
44	NC	/	Not connect	

P: Power, I: Input, O: Output, I/O: In/Output, RF: Analog RF Port

Ball Name	Aux Func.0	Aux Func.1	Aux Func.2	Aux Func.3	Aux Func.4	Aux Func.5	Aux Func.6	Aux Func.7	Aux Func.8	Aux Func.9	Aux Func.10
GPIO_0	GPIO0	EINT0		U1RT5	SCL1	I2S_RX	JTDI		WIFI_ANT_5 ELO	BT_PRI1	PWM0
GPIO_1	GPIO1	EINT1		U1CT5	SDA1	I2S_TX	JTM5		WIFI_ANT_5 EL1	BT_PRI3	PWM1
GPIO_2	GPIO2	EINT2		URXD1	PWM0	I2S_WS	JTCK	CLK00		BT_PRI0	WIFI_ANT_5 EL4
GPIO_3	GPIO3	EINT3		UTXD1	PWM1	I2S_CK	JTRST_B			WIFI_ANT_5 EL2	I2S_CK
GPIO_4	GPIO4	SPISLV_A_SI O2	SPIMST_A_SI O2	EINT4		I2S_MCLK	JTDO			WIFI_ANT_5 EL3	I2S_MCLK
GPIO_11	GPIO11	EINT11	PWM3	URXD2	MA_MC0_CK	SLV_MC0_CK	CLK02			WIFI_ANT_5 ELO	I2S_RX
GPIO_12	GPIO12	SPISLV_B_SI O3	SPIMST_B_SI O3	UTXD2	MA_MC0_C M0	SLV_MC0_C M0	EINT12			WIFI_ANT_5 EL1	I2S_TX
GPIO_13	GPIO13	SPISLV_B_SI O2	SPIMST_B_SI O2	U2RT5	MA_MC0_D A0	SLV_MC0_D A0	CLK04		EINT13		I2S_WS
GPIO_14	GPIO14	SPISLV_B_SI O1	SPIMST_B_SI O1	TDM_RX	MA_MC0_D A1	SLV_MC0_D A1	PWM4		EINT14		CLK04
GPIO_15	GPIO15	SPISLV_B_SI O0	SPIMST_B_SI O0	TDM_TX	MA_MC0_D A2	SLV_MC0_D A2	SCL1		EINT15		PWM3
GPIO_16	GPIO16	SPISLV_B_SCK	SPIMST_B_SCK	TDM_WS	MA_MC0_D A3	SLV_MC0_D A3	SDA1		EINT16		
GPIO_17	GPIO17	SPISLV_B_CS	SPIMST_B_CS	TDM_CK	PWM5	CLK03	AUXADC0		EINT17		BT_PRI0
GPIO_21	GPIO21	URXD0	EINT19	SCL1		PWM5					

3. Electrical and Thermal Specifications

Recommended Operating Conditions

Parameters		Min	Typ	Max	Units
Ambient Operating Temperature		-20	25	70	°C
External Antenna VSWR		1.92	/	/	/
Supply Voltage	VDD33	3.1	3.3	3.5	V

Current Consumption

Conditions : VDD=3.3V ; Ta:25°C			
Use Case	VDD Current (average)		
	Typ	Max	Units
2.4G 1Mbps TX @17dBm (RF-Test)	235	270	mA
2.4G 1Mbps RX (RF-Test)	41	50	mA
2.4G 11Mbps TX@17dBm (RF-Test)	90	125	mA
2.4G 11Mbps RX (RF-Test)	40	51	mA
2.4G 6Mbps TX @15dBm (RF-Test)	198	232	mA
2.4G 6Mbps RX (RF-Test)	40	50	mA
2.4G 54Mbps TX @15dBm (RF-Test)	116	134	mA
2.4G 54Mbps RX (RF-Test)	39	50	mA
2.4G MCS0(HT20) TX @15dBm (RF-Test)	195	230	mA
2.4G MCS0(HT20) RX (RF-Test)	42	51	mA
2.4G MCS7(HT20) TX @15dBm (RF-Test)	109	139	mA

2.4G MCS7(HT20) RX (RF-Test)	40	52	mA
2.4G MCS0(HT40) TX @14dBm (RF-Test)	180	215	mA
2.4G MCS0(HT40) RX (RF-Test)	40	51	mA
2.4G MCS0(HT40) TX @14dBm (RF-Test)	96	120	mA
2.4G MCS0(HT40) RX (RF-Test)	41	50	mA

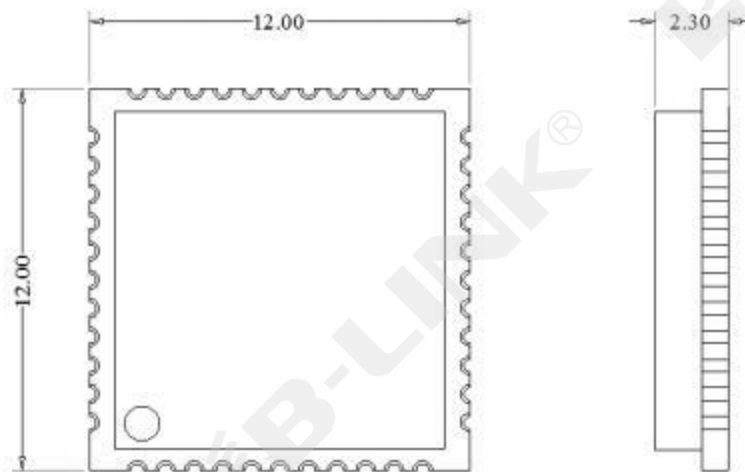
4. WIFI RF Specifications

Conditions : VDD=3.3V ; Ta:25℃			
Features	Description		
WLAN Standard	IEEE 802.11b/g/n		
Frequency Range	2.4~2.4835GHz (2.4GHz ISM Band)		
Channels	Ch1~Ch13 (For 20MHz Channels)		
Modulation	802.11b (DSSS): CCK, DQPSK, DBPSK; 802.11g (OFDM): BPSK, QPSK, QAM16, QAM64; 802.11n (OFDM): BPSK, QPSK, QAM16, QAM64;		
Date Rate	802.11b: 1, 2, 5.5, 11Mbps; 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps; 802.11n (HT20): MCS0~MCS7 6.5~72.2Mbps; 802.11n (HT40): MCS0~MCS7 13.5~150Mbps;		
Frequency Tolerance	≤±15ppm		
2.4G Transmitter Specifications			
TX Rate	TX Power (dBm)	TX Power Tolerance (dB)	EVM (dB)
802.11b@1~11Mbps	17	±2dBm	≤-15
802.11g@6Mbps	17	±2dBm	≤-15
802.11g@54Mbps	15	±2dBm	≤-25
802.11n@HT20_MCS0	17	±2dBm	≤-10
802.11n@HT20_MCS7	14	±2dBm	≤-28
802.11n@HT40_MCS0	17	±2dBm	≤-10
802.11n@HT40_MCS7	14	±2dBm	≤-28
2.4G Receiver Specifications			
RX Rate	Min Input Level (dBm)	Max Input Level (dBm)	PER
802.11b@1Mbps	-94	-10	< 8%
802.11b@11Mbps	-86	-10	< 8%

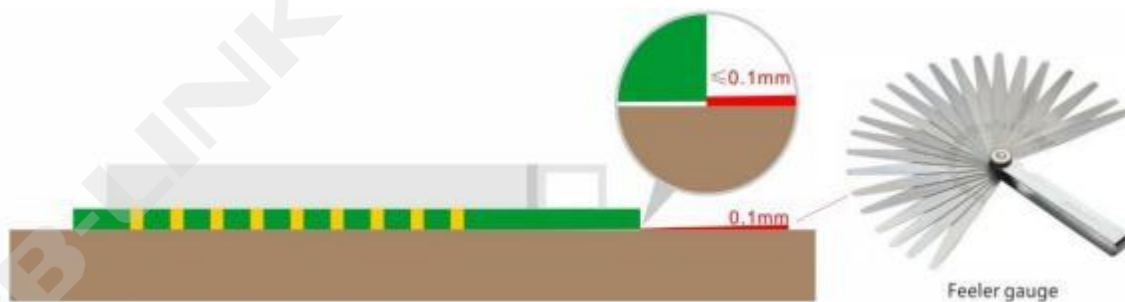
802.11g@6Mbps	-88	-10	< 10%
802.11g@54Mbps	-74	-10	< 10%
802.11n@HT20_MCS0	-88	-10	< 10%
802.11n@HT20_MCS7	-71	-10	< 10%
802.11n@HT40_MCS0	-87	-10	< 10%
802.11n@HT40_MCS7	-68	-10	< 10%

5. Mechanical Specifications

Module Outline Drawing

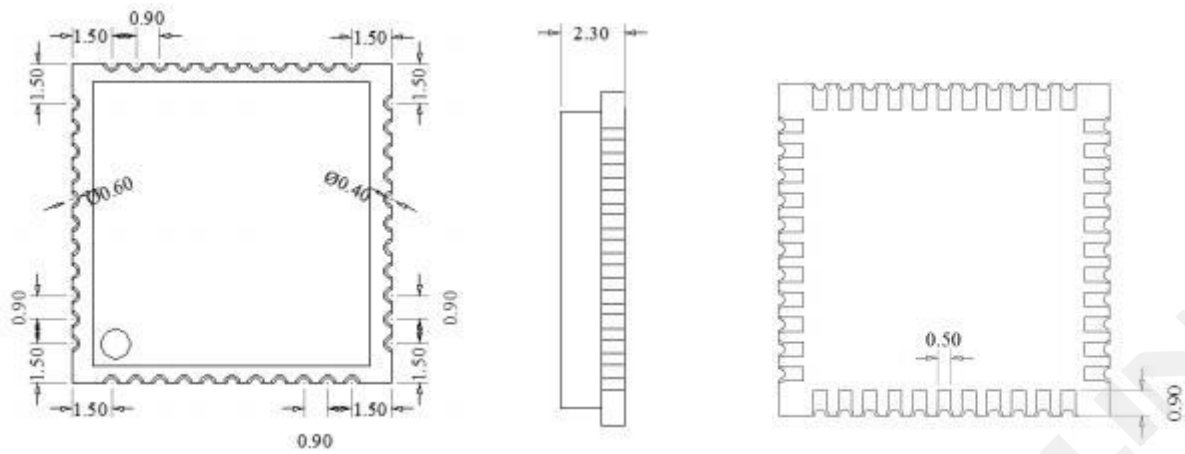


Module dimension: 12*12*2.3mm(L*W*H; Tolerance: ± 0.15 mm)



Module Bow and Twist: ≤ 0.1 mm

Mechanical Dimensions



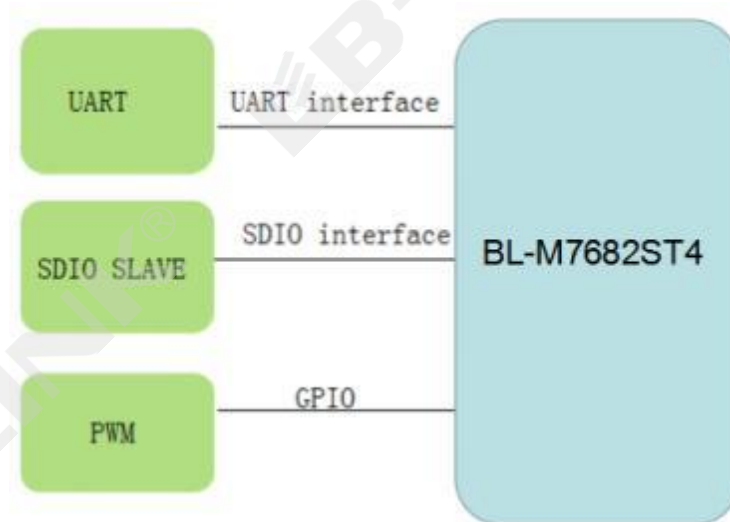
Top view

Side view

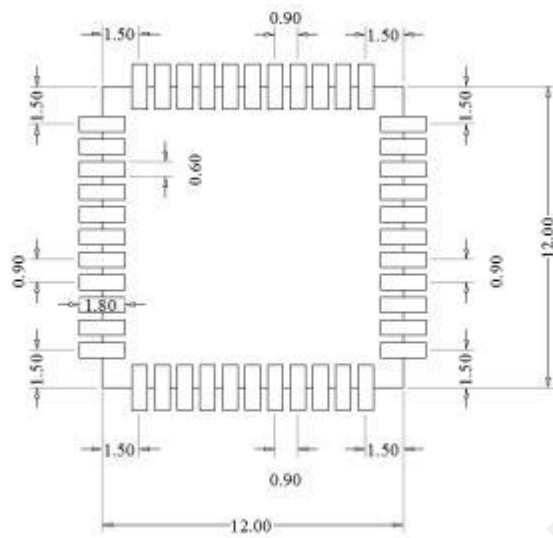
Bottom view

6. Application Information

Typical Application Circuit

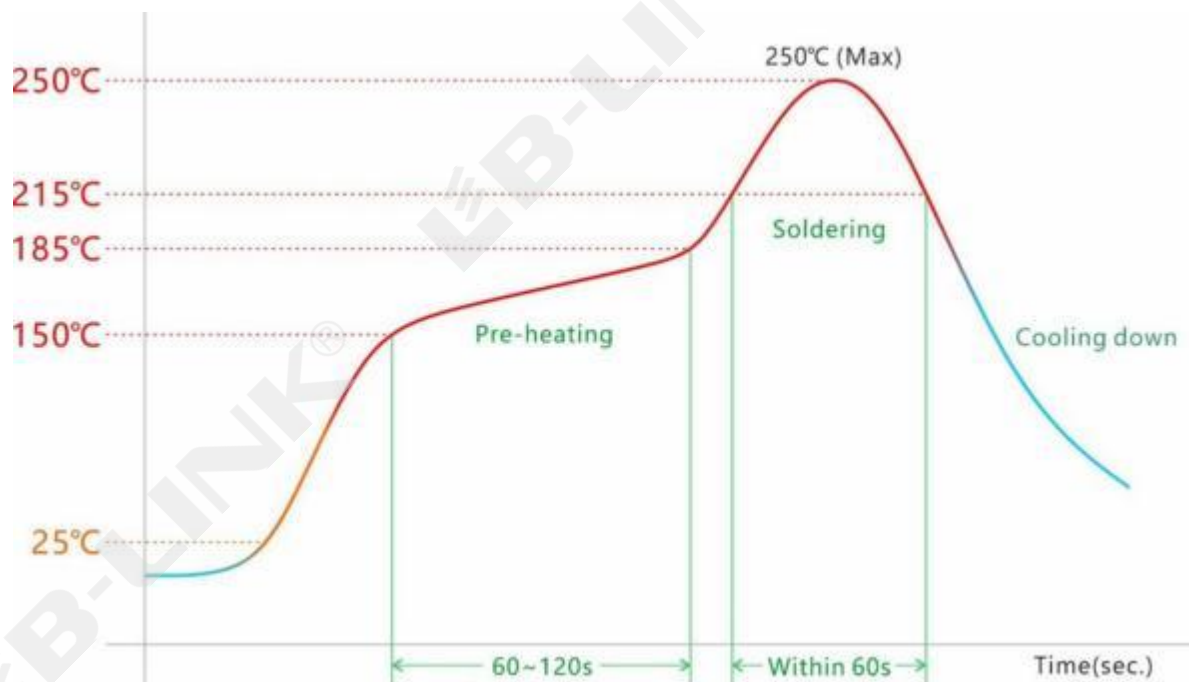


Recommend PCB Layout Footprint



Top view

Reflow Soldering Standard Condition



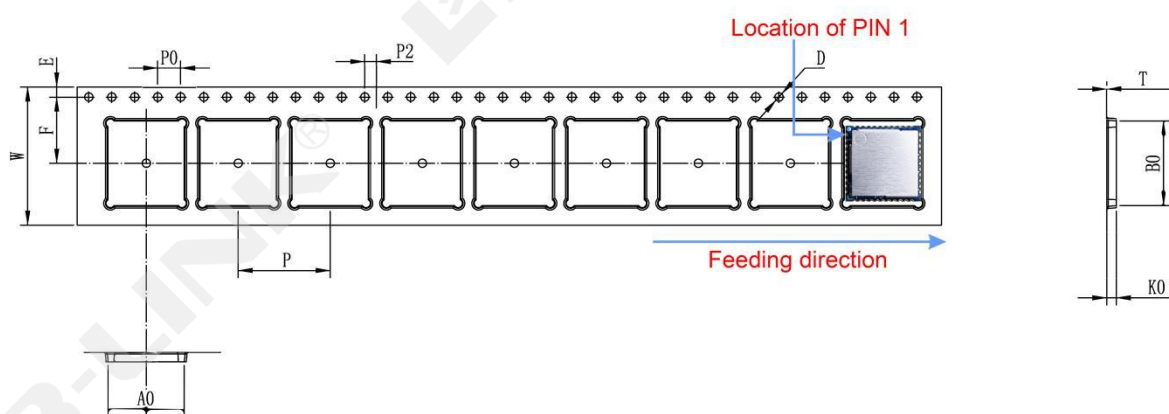
Please use the reflow within 2 times.
Set up the highest temperature within 250°C .

7. Key Components Of Module

No.	Parts	Specification	Manufacturer	Note
1	Chipset	MT7682MN	MEDIATEK	
2	PCB	BL-M7682ST4	Shen Zhen Tie Fa Technology limited	
			Guang Dong KINGSHINE ELECTRONICS CO.,LTD	
			Quzhou Sunlord Electronics Co.,Ltd	
3	Crystal	26MHz-9pF-12ppm-2520	LUCKI CM ELECTRONICS CO,LTD	
			SHENZHEN KAIYUEXIANG ELECTRONICS CO,LTD	

8. Package and Storage Information

Package Dimensions



ITEM	W	A0	B0	K0	E	F	P	P0	P2	D	T
DIM	24.00±0.3	12.50±0.1	12.50±0.1	2.40±0.1	1.75±0.1	11.5±0.1	20.00±0.1	4.00±0.1	2.00±0.1	Ø1.5±0.1	0.30±0.05



Package specification:

1. 1000 modules per roll and 5,000 modules per box.
2. Outer box size: 37.5*36*29cm.
3. The diameter of the blue environment-friendly rubber plate is 13 inches, with a total thickness of 28mm (with a width of 24mm carrying belt).
4. Put 1 package of dry agent (20g) and humidity card in each anti-static vacuum bag.
5. Each carton is packed with 5 boxes.

Storage Conditions

Absolute Maximum Ratings:

Storage temperature: -40°C to +85°C,
Storage humidity: 10% to 95 (Non-Condensing)

Recommended Storage Conditions:

Storage temperature: 5°C to +40°C,
Storage humidity: 20% to 90% RH



ESD CAUTION

Please use this Module within 12month after vacuum-packaged.

The Module shall be stored without opening the packing.

After the packing opened, the Module shall be used within 72hours.

When the color of the humidity indicator in the packing changed,
the Module shall be baked before soldering.

Baking condition: 60°C, 24hours, 1time.

ESD Sensitivity:

The Module is a static-sensitive electronic device.

Do not operate or store near strong electrostatic fields.

Take proper ESD precautions!