

# **BLE Module**

## **ME52BS01**

## **Datasheet**

V 1.0.0

<b>Applicable Product Model</b>
<b>ME52BS01-TLSR8258</b>

# Version Note

Version	Details	Contributor(s)	Date	Notes
1.0.0	First edit	Michelle	2024.03.04	

# ME52BS01-TLSR8258

**Cost-effective, Bluetooth 5.3 module with optional PCB/IPEX antennas**



The ME52BS01 is a highly flexible, ultra-low power, cost-effective wireless BLE 5.3 module based on the TLSR8258. Its powerful 32-bit RISC-V processor has a maximum frequency of 48Mhz. In addition, it also comes with 512kB FLASH program space, 64 KB RAM and other powerful supporting resources to provide a perfect solution for Bluetooth connection. The hardware supports the development of BLE, BLE mesh, IEEE 802.15.4, Zigbee, 2.4GHz proprietary protocols, etc.

## ■ Features

- Bluetooth 5.3
- High Cost Performance
- Support Optional PCB Antenna, IPEX Antenna

## ■ Applications

- Smart home
- Intelligent light control
- Smart wearable device
- Consumer electronics
- Intelligent medical care
- Security equipment
- Automotive equipment
- Sports and fitness equipment
- Instrumentation

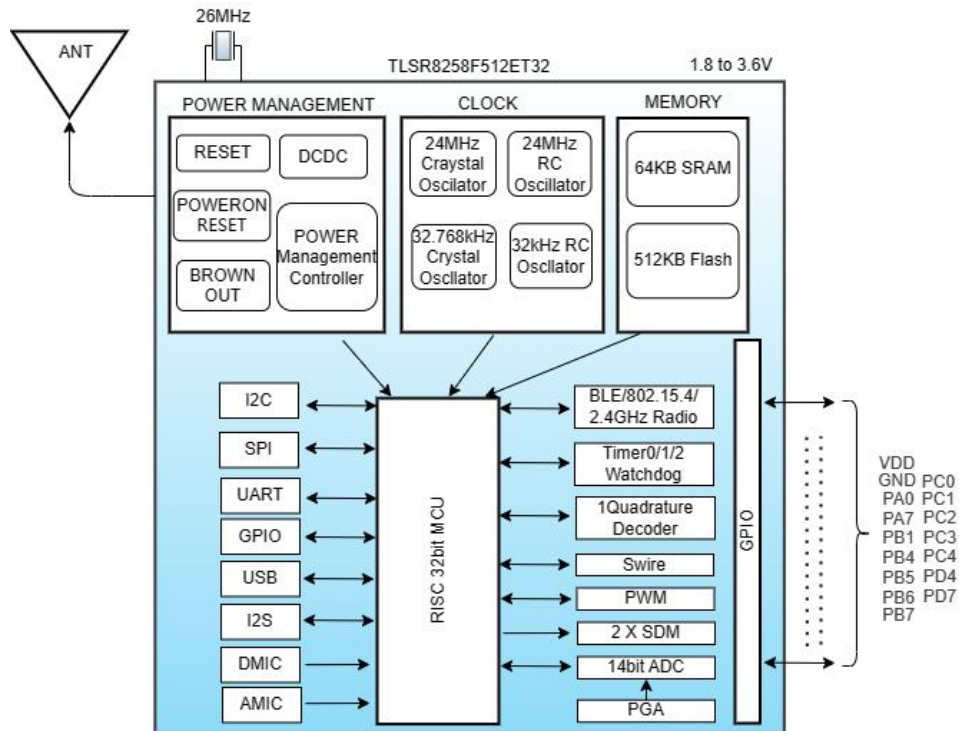
## ■ Key Parameter

Chip Model	TLSR8258	Antenna	PCB/IPEX(MHF 1)
Module Size	20×12.7×2mm	GPIO	14
Flash	512KB	RAM	64KB
Receiving Sensitivity	-96dBm	Transmission Power	-45 ~ +10dBm
Emitting Current	0dBm-4.8mA	Receiving Current	5.3mA

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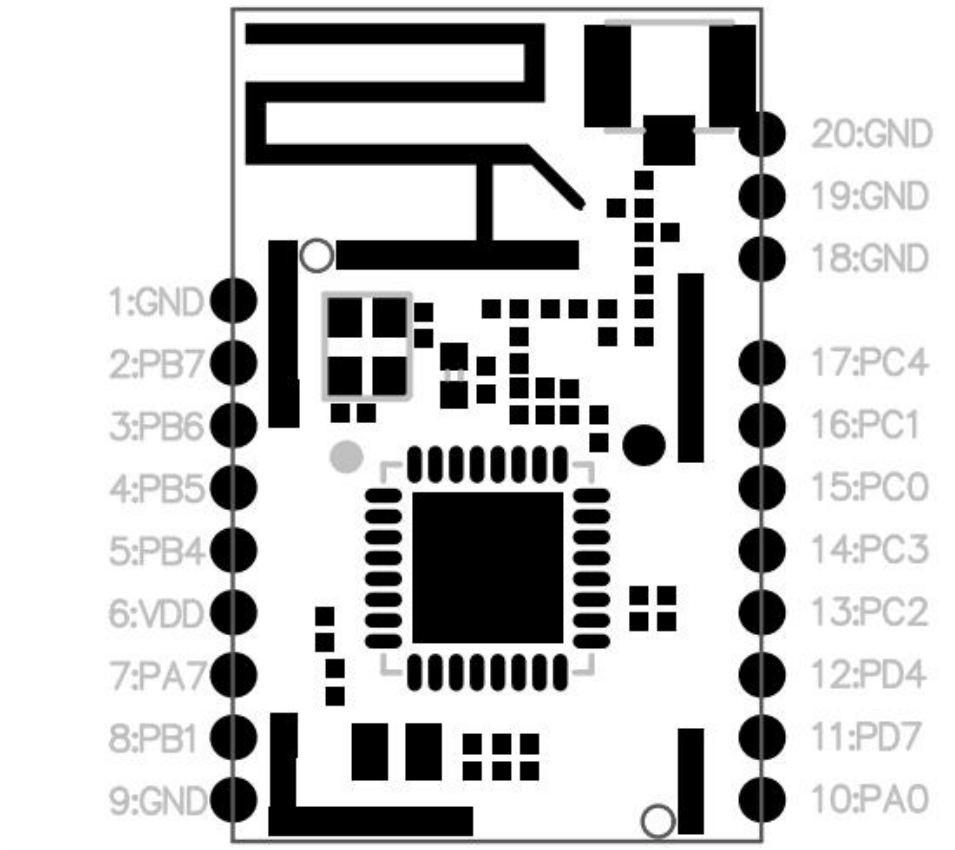
# 1 Block Diagram



# 2 Electrical Specification

Parameter	Values	Notes
Working Voltage	1.8V-3.6V	To ensure RF work, supply voltage suggest not lower than 2.3V
Working Temperature	-40°C~+85°C	Storage temperature is -40°C~+105°C
Transmission Power	-45 ~ +10dBm	Configurable
Current(RX)	5.3mA	RF receiving current under 1Mbps pattern
Current(TX)	4.8mA	RF transmission current under 0dB pattern
Module Dimension	20*12.7*2mm	
Quantity of IO Port	14	

### 3 Pin Description

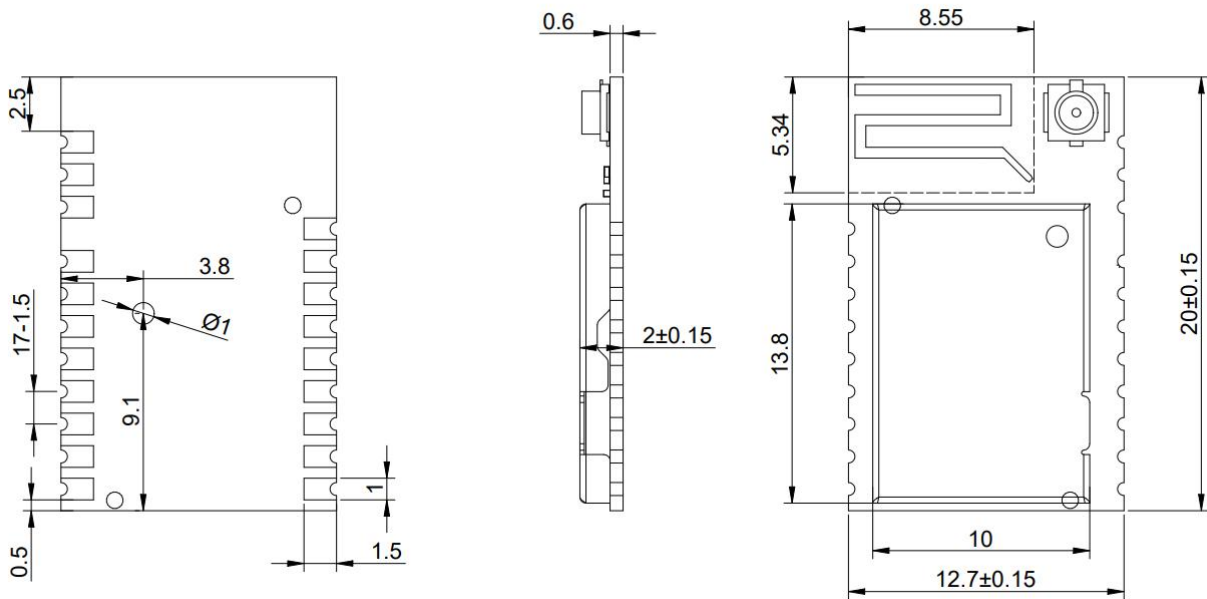


## 4 Pin Definition

Pin Number	Symbol	Type	Definition
1/9/18/19/20	GND	Negative power supply	GND
2	PB7	Digital I/O	I/O pin multiplexing,UART_RX / GPIO PB7;
3	PB6	Digital I/O	I/O pin multiplexing,UART_RTS / GPIO PB6
4	PB5	Digital I/O	I/O pin multiplexing, GPIO PB5
5	PB4	Digital I/O	I/O pin multiplexing,, GPIO PB4
6	VDD	Power Positive	Power supply, 1.7V-3.6V with this pin
7	PA7	Digital I/O	I/O pin multiplexing, Single wire slave / GPIO PA7
8	PB1	Digital I/O	I/O pin multiplexing,UART_TX / GPIO PB1
10	PA0	Digital I/O	I/O pin multiplexing,UART_RX / GPIO PA0
11	PD7	Digital I/O	I/O pin multiplexing, GPIO PD7
12	PD4	Digital I/O	I/O pin multiplexing, GPIO PD4
13	PC2	Digital I/O	I/O pin multiplexing,(optional) 32kHz crystal output / GPIO PC2
14	PC3	Digital I/O	I/O pin multiplexing,(optional) 32kHz crystal input/UART_RX / GPIO PC3
15	PC0	Digital I/O	I/O pin multiplexing,GPIO PC0
16	PC1	Digital I/O	I/O pin multiplexing,GPIO PC1
17	PC4	Digital I/O	I/O pin multiplexing,GPIO PC4

**Notice:** The I/O pin multiplexing is only partially defined as an example. For more detailed pin multiplexing definitions, please refer to the chip specifications.

## 5 Mechanical Drawing

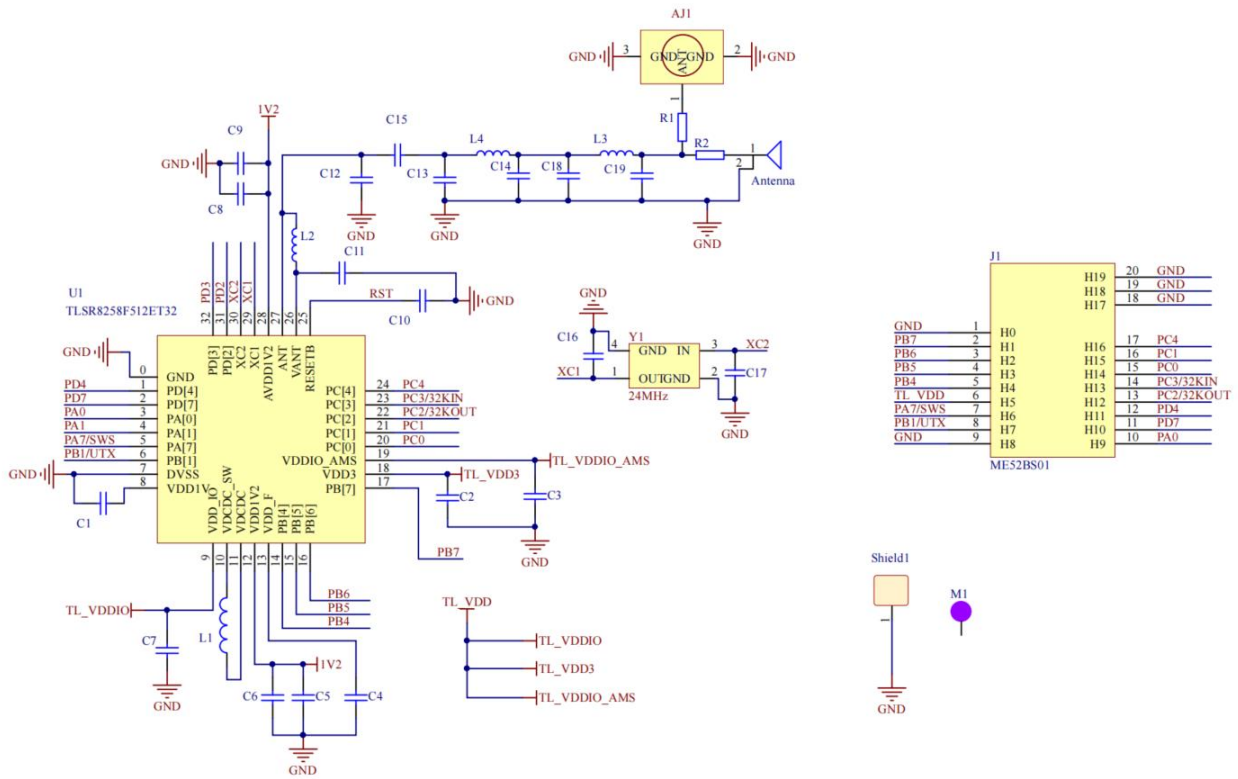


\* (Default unit: mm    Default tolerance: ±0.1)

**Notice :** The recommended pad size is 2.0\*1mm with a pad extension of 0.5mm



# 6 Electrical Schematic

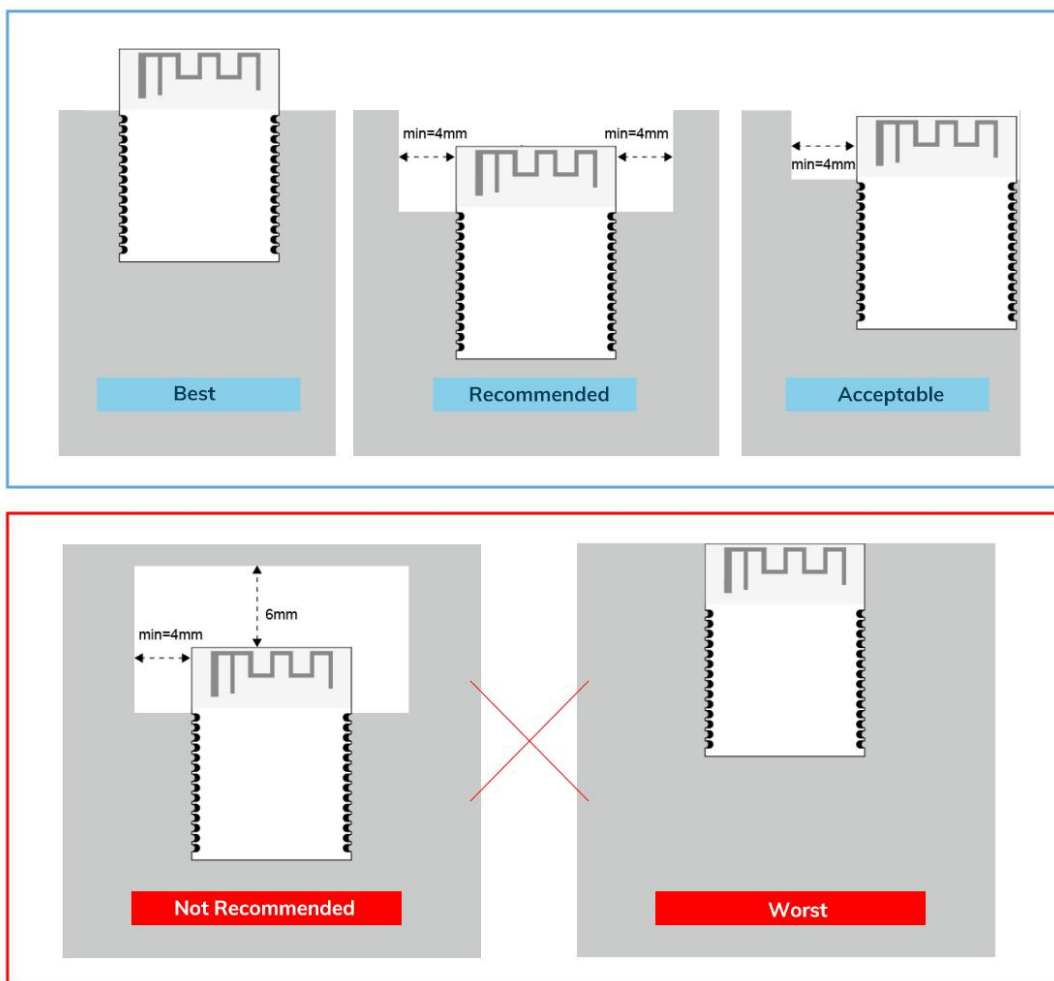


**Notice:** Before placing an order, please confirm the specific configuration required with the salesperson.

## 7 PCB Layout

There should be no GND plane or metal cross wiring in the module antenna area, and components should not be placed nearby. It is best to make a hollow or clear area, or place it on the edge of the PCB board.

**Notice:** Refer to examples as below, and highly suggest to use the first design and the adjustment of modules antenna design according to the first wiring.



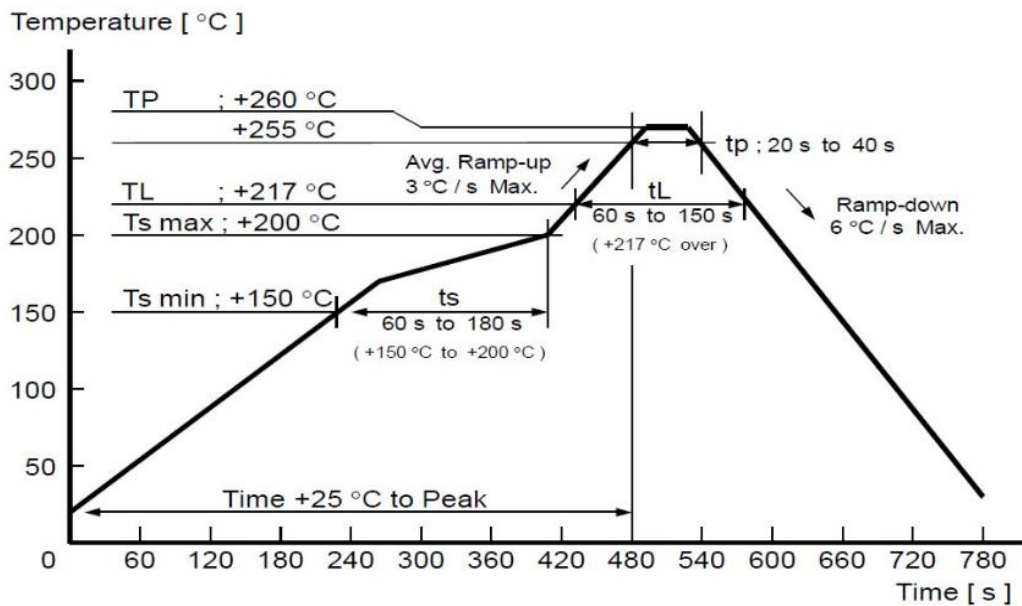
**Layout Notes:**

- 1) Preferred Module antenna area completely clearance and not be prevented by metals, otherwise it will influence antenna's effect (as above DWG. indication).
- 2) Cover the external part of module antenna area with copper as far as possible to reduce the main board's signal cable and other disturbing.
- 3) It is preferred to have a clearance area of 4 square meter or more area around the module antenna (including the shell) to reduce the influence to antenna.
- 4) Device should be grounded well to reduce the parasitic inductance.
- 5) Do not cover copper under module's antenna in order to avoid affect signal radiation or lead to transmission distance affected.
- 6) Antenna should keep far from other circuits to prevent radiation efficiency reduction or affects the normal operation of other lines.
- 7) Module should be placed on edge of circuit board and keep a distance away from other circuits.
- 8) Suggesting to use magnetic beads to insulate module's access power supply.

## 8 Reflow and Soldering

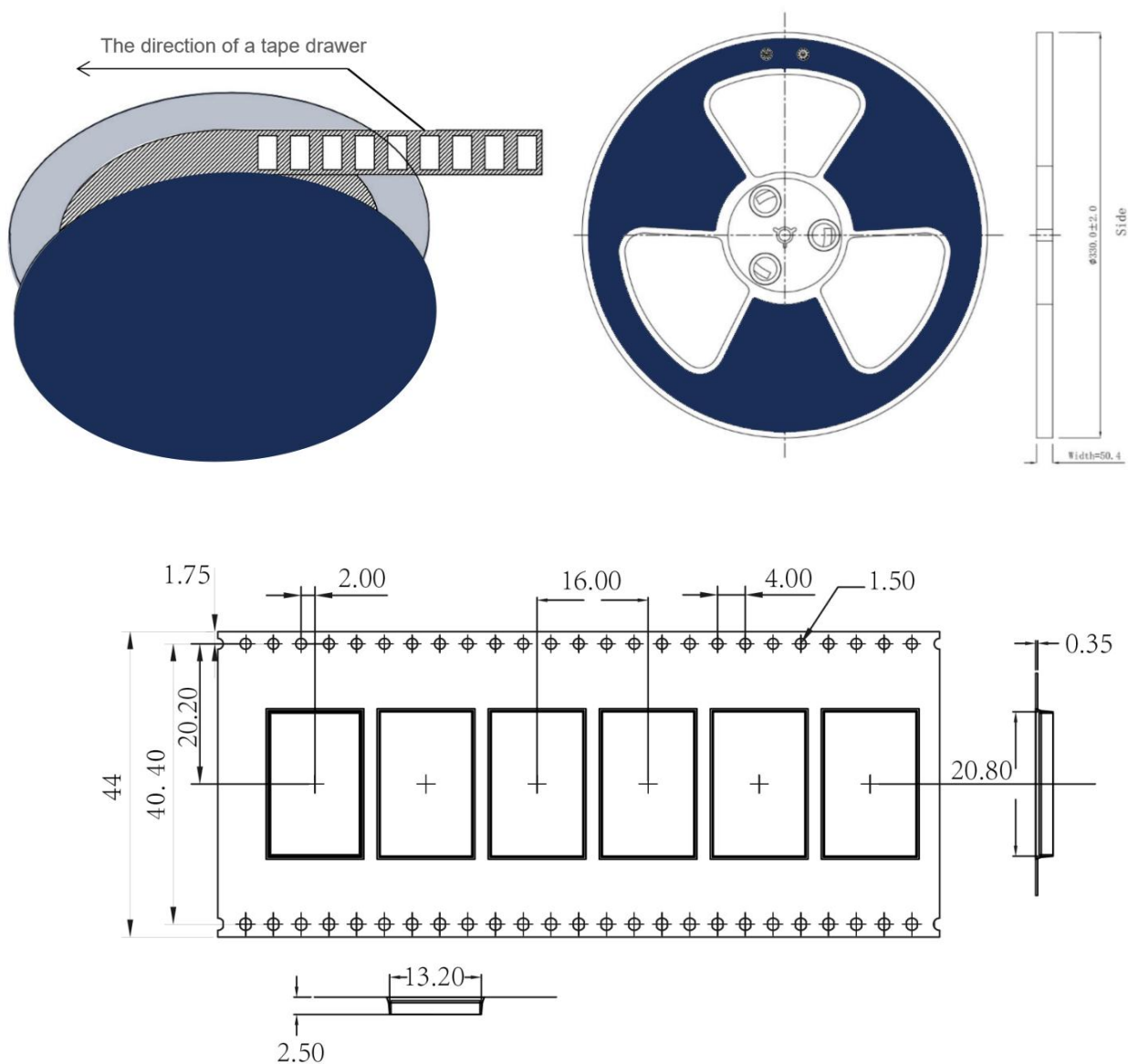
1) Do SMT according to above reflow oven temperature deal curve. Max. Temperature is 260°C;

Refer to IPC/JEDEC standard; Peak TEMP<260°C; Times: ≤2 times, suggest only do once reflow soldering on module surface in case of SMT double pad involved. Contact us if special crafts involved.



- 2) Suggesting to make 0.2mm thickness of module SMT for partial ladder steel mesh, then make the opening extend 0.8mm
- 3) After unsealing, it cannot be used up at one time, should be vacuumed for storage, couldn't be exposed in the air for long time. Please avoid getting damp and soldering-pan oxidizing. If there are 7 to 30 days interval before using online SMT, suggest to bake at 65-70 °C for 24 hours without disassembling the tape.
- 4) Before using SMT, please adopt ESD protection measure.

## 9 Package Information



\* (Default unit: mm Default tolerance:  $\pm 0.1$ )

Packing Detail	Specification	Net Weight	Gross Weight	Dimension
Quantity	1200PCS	1200g	1996g	W: 44mm,T:0.35mm

**\* Note:** Default weight tolerance all are within 10g (except the special notes)

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Every product undergoes stringent testing, including transmit power, sensitivity, power consumption, stability, and aging tests. Our fully automated module production line is now in full operation, boasting a production capacity in the millions, capable of meeting high-volume production demands.

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**Related documents:** Chip specification

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