

# **BLE Module**

## **MS88SF2**

### **Datasheet**

V 1.1.0

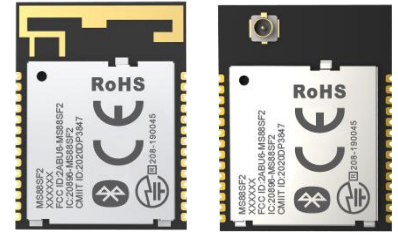
<b>Applicable Product Model</b>
<b>MS88SF2-nRF52840</b>

## Version Note

Version	Details	Contributor(s)	Date	Notes
1.0.0	First edit	Eddie	2022.03.01	
1.1.0	Layout Changes	Michelle	2023.10.07	

# MS88SF2-nRF52840

**High-performance, fully certified, multi-protocol Bluetooth 5.4 module**



**PCB**

**IPEX**

The MS88SF2 is a low-power, cost-effective wireless BLE 5.4 module based on the nRF52840 SoC. Its powerful 32-bit ARM Cortex™ M4F CPU, 1M FLASH program space, 256kB RAM, integrated 2.4 GH transceiver, and other powerful supporting resources provide the perfect solution for Bluetooth connectivity. nRF52840 can support protocols such as ANT, BLE, BLE MESH, ZIGBEE, and THREAD. With a built-in PA/LNA, it has an estimated range of up to 250 meters in open space at a data rate of 125kbps.

## ■ Features

- Bluetooth 5.4
- Fully certified
- High-performance
- Support ANT, BLE, BLE MESH, ZIGBEE and THREAD protocols, etc

## ■ Certification Information

BQB、CE、FCC、REACH、ROHS、SRRC、TELEC、IC、WPC、RCM, etc

## ■ Application

- Smart Buildings
- Consumer Electronics
- Smart Healthcare
- Security Equipment
- Automotive Devices
- Smart Agriculture

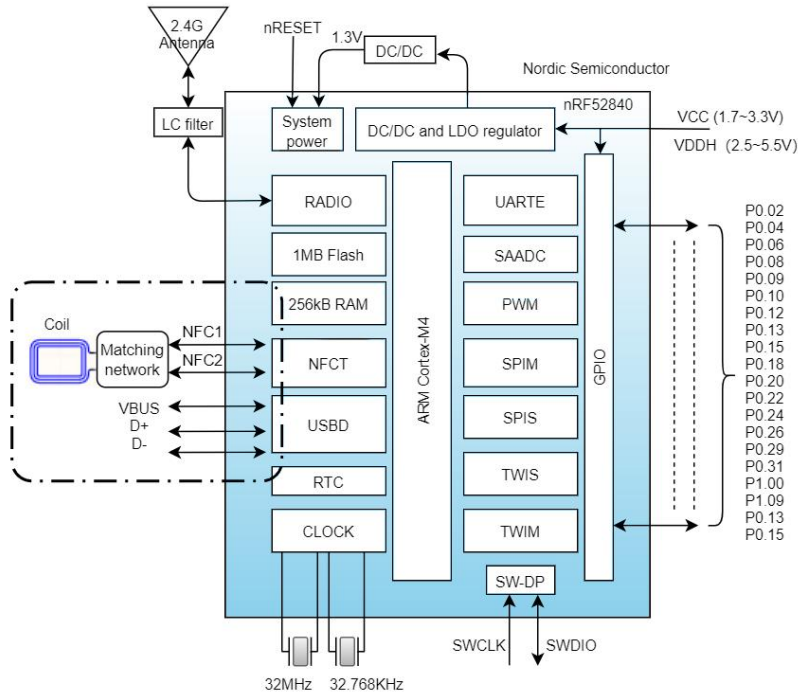
## ■ Key parameter

<b>Chip Model</b>	nRF52840	<b>Antenna</b>	PCB/IPEX
<b>Module Size</b>	23.2×17.4×2mm	<b>GPIO</b>	20
<b>Flash</b>	1M	<b>RAM</b>	256KB
<b>Receiving Sensitivity</b>	-95dBm(1Mbps) -103dBm(125kbps)	<b>Transmission Power</b>	-40 ~ +8dBm
<b>Current(TX)</b>	0dBm-4.6mA	<b>Current(RX)</b>	4.8mA

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# 1 Block Diagram

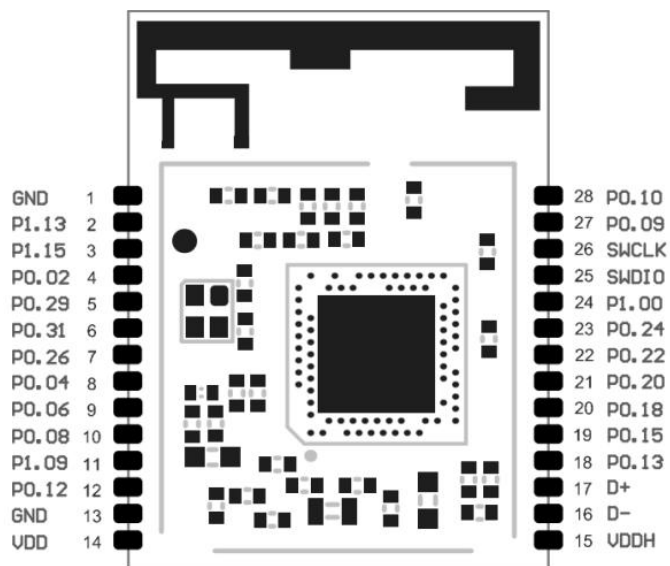


# 2 Electrical Specification

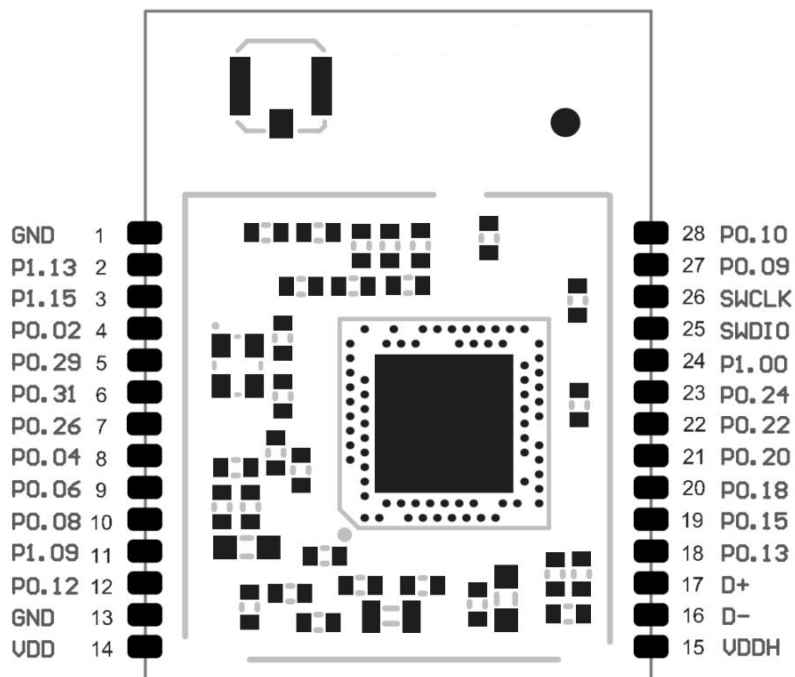
Parameter	Values	Notes
Working Voltage	1.7V-5.5V	To ensure RF work, supply voltage suggest not lower than 3V
Working Temperature	-40°C~+85°C	Storage temperature is -40°C~+125°C
Transmission Power	-40 ~ +8dBm	Configurable
Current(RX)	4.6mA	RF receiving current under 1Mbps pattern
Current(TX)	4.8mA	RF transmission current under odB pattern
Module Dimension	23.2*17.4*2mm	
Quantity of IO Port	20	

### 3 Pin Description

#### 3.1 PCB Antenna



#### 3.2 IPEX connector

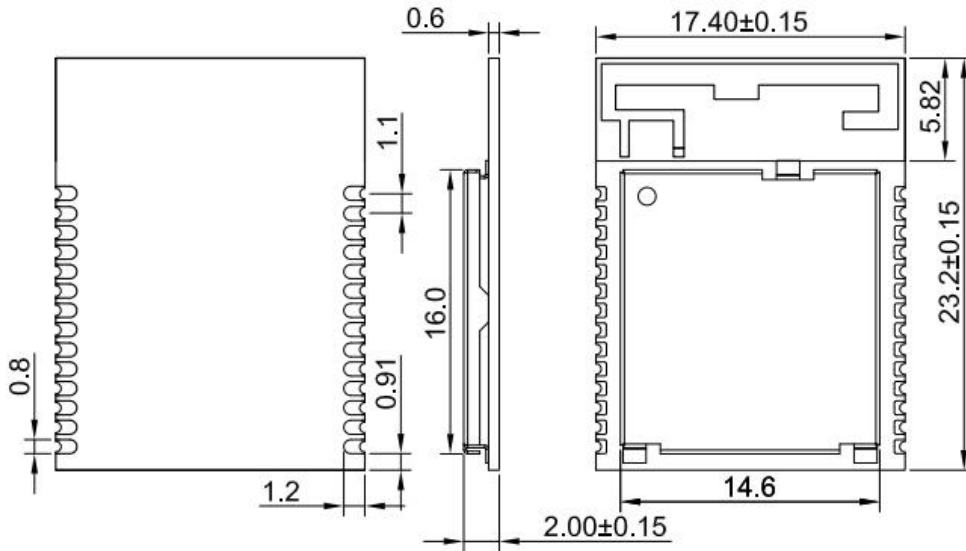


## 4 Pin Definition

Pin Number	Symbol	Type	Definition
14	VDD	power supply	Power supply, 1.7V-3.6V, use this pin for power supply, need to short VDD and VDDH
15	VDDH	power supply	Power supply, 2.5V-5.5V, use this pin for power supply, not connected to VDD pin
1/13	GND	ground	ground
26/25	SWCLK/SW DIO	Burn Pins	Burn pins, burn only need to connect the power supply pin, ground, and these two pins
2-12/18-24/ 27-28	P1.13-P0.21 P0.13-P1.00 P0.09-P0.10	I/O	General Purpose I/O Port
17	D+	Digital interfaces	USB D+
16	D-	Digital interfaces	USB D-

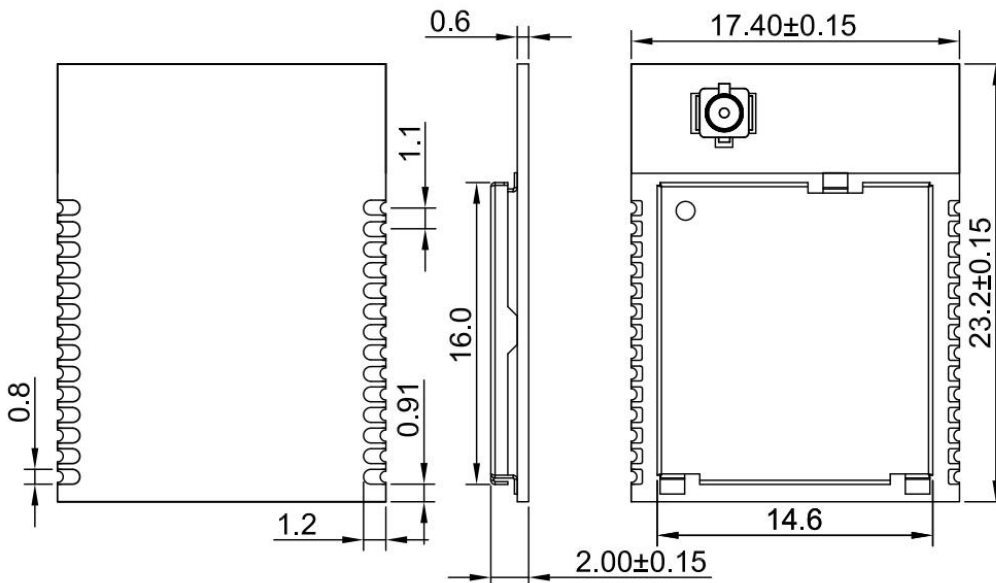
## 5 Mechanical Drawing

### 5.1 PCB Antenna



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

### 5.2 IPEX connector

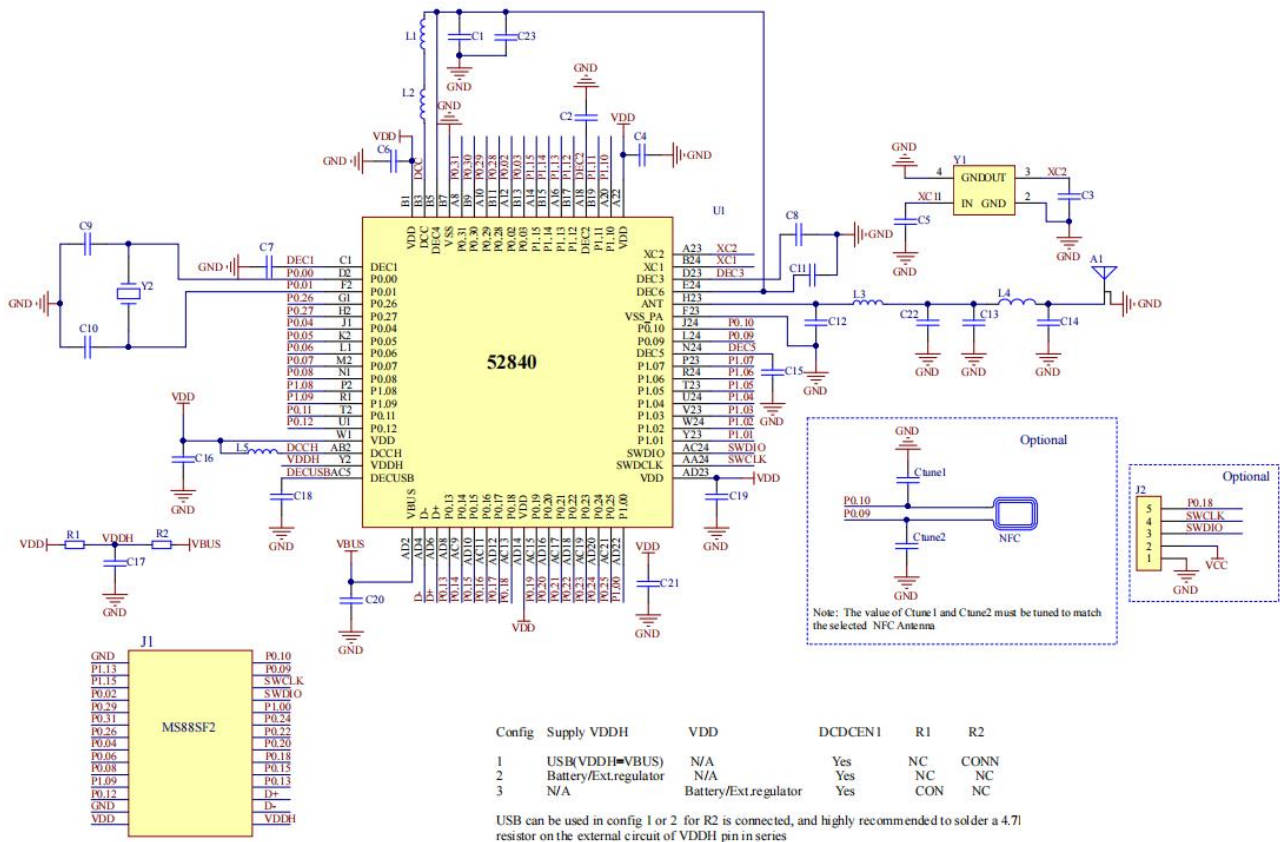


\* (Default unit: mm Default tolerance: ±0.1)

**Notice:** The recommended pad size is 1.8\*0.8mm with a pad extension of 0.5mm



# 6 Electrical Schematic

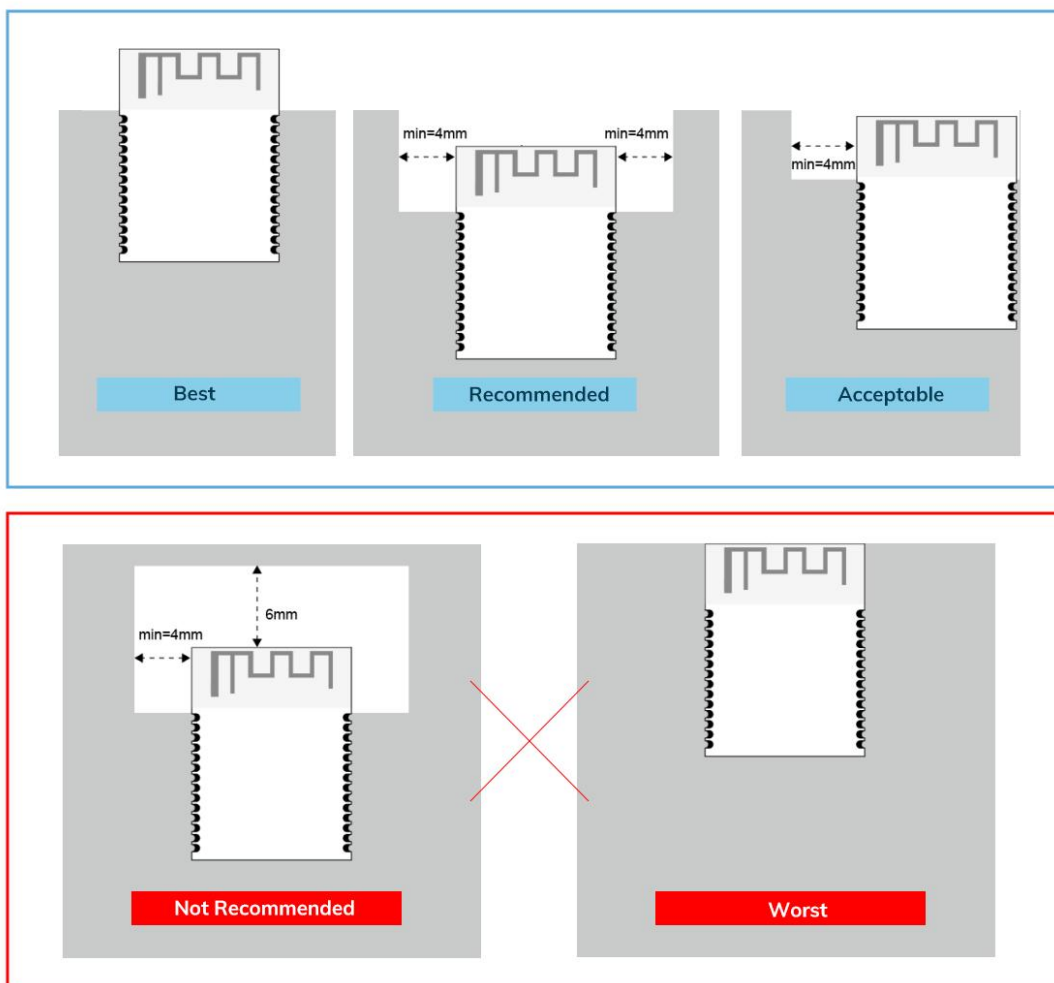


**Notice:** Before placing an order, please confirm the specific configuration required with the salesperson.

## 7 PCB Layout

Module antenna area couldn't have GND plane or metal cross line, couldn't place components nearby. It is better to make hollow out or clearance treatment or place it on the edge of 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.



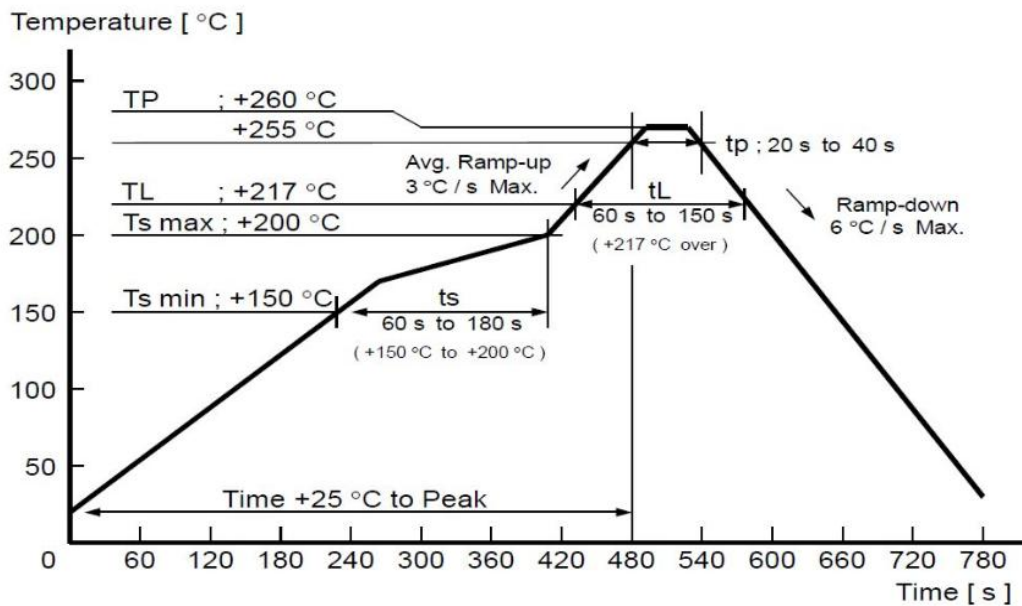
**Layout notes:**

- 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

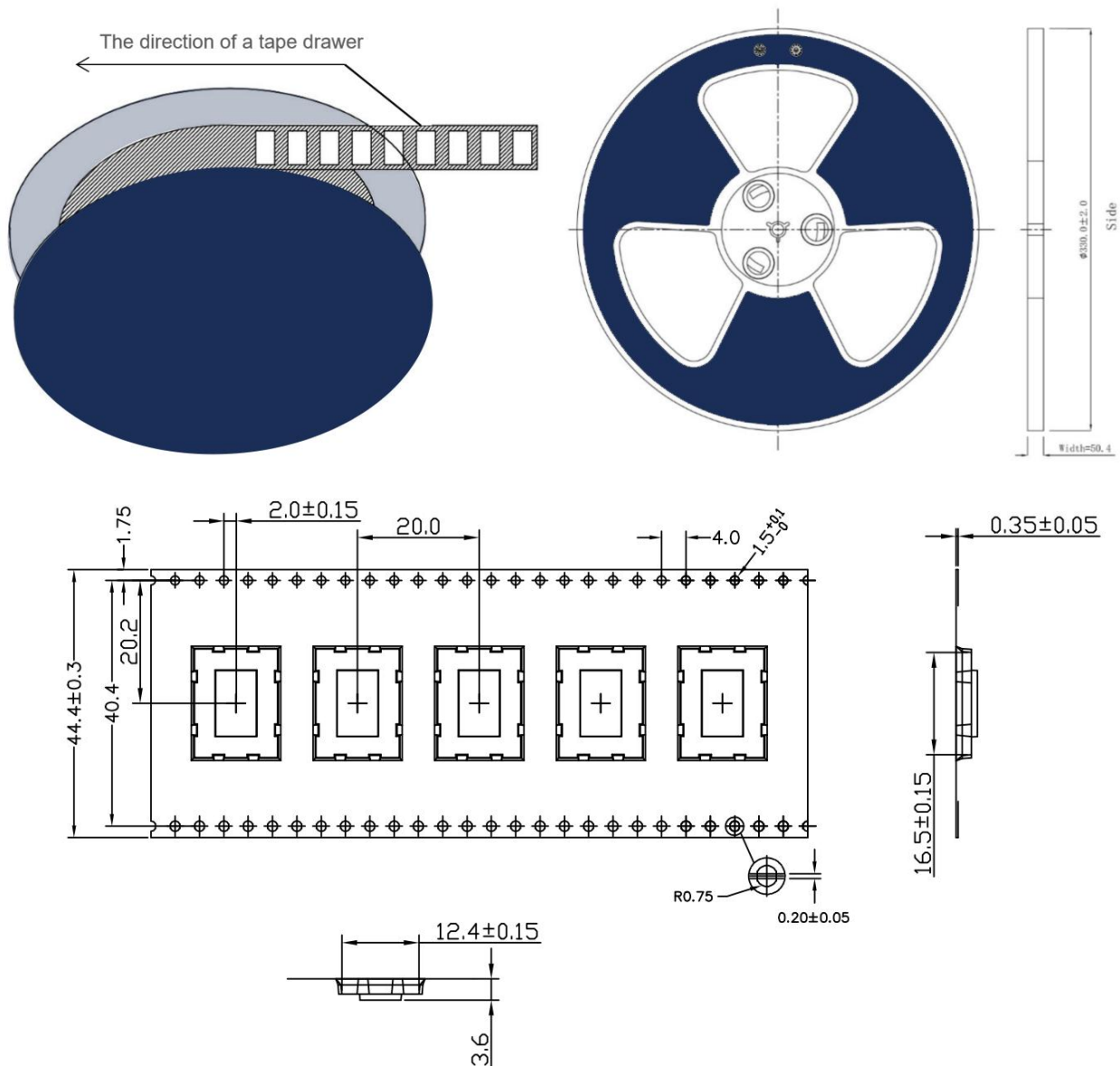
1) Do SMT according to above reflow oven temperature deal curve. Max. Temperature is 260°C;

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	650PCS	780g	1520g	W: 44mm,T:0.35mm

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

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Cognizant of our commitment to quality, we operate our own factory equipped with state-of-the-art production facilities and a meticulous quality management system. We hold certifications for ISO9001, ISO14001, ISO27001, OHSAS18001, BSCI.

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.

## ● Contact Us

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**Web:** [www.minewsemi.com](http://www.minewsemi.com)

**Email:** [minewsemi@minew.com](mailto:minewsemi@minew.com)

**Linkedin:** [www.linkedin.com/company/minewsemi](http://www.linkedin.com/company/minewsemi)

**Shop:** <https://minewsemi.en.alibaba.com/>

**Tel:** +86 0755-28010353

**Address:** 3rd Floor, I Building, Gangzhilong Science Park, NO.6, Qinglong Road, Longhua District, Shenzhen, China

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**Related documents:** Chip specification

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# MINEWSEMI

Tel: 0086-755-2801 0353

Email: [minewsemi@minew.com](mailto:minewsemi@minew.com)

Web: [www.minewsemi.com](http://www.minewsemi.com)

Address: 3rd Floor, Building I, Gangzhilong Science Park, Qinglong Road, Longhua District, Shenzhen, 518109, China

