

BLE Module

MS44SF1

DateSheet

V 1.1.0

Applicable Product Model
MS44SF2-nRF52820

Version Note

Version	Details	Contributor(s)	Date	Notes
1.0.0	First edit	Coral	2022.06.23	
1.1.0	Layout Changes	Michelle	2023.10.07	

MS44SF1-nRF52820

Low-Power, Long-Range, Cost-Effective, Full IO Port, Bluetooth 5.4 Module with USB Interface



PCB

MS44SF1 is using nRF52820 with ARM cortex-M4 core, 256kB flash, 32kB RAM. it can work with voltage range of 1.7V-5.5V, temperature range of -40°C~+125°C. Diversified digital communication interfaces allow this module to be used in a wide range of applications. It supports Bluetooth 5.0 long range function and Bluetooth 5.1 direction finding function, which means that the chip can realize the distance transmission of up to 600m, and it can also be used to realize the precise positioning of Bluetooth AOA or AOD.

■ Features

- Bluetooth 5.4
- Transmission distance up to 600m
- All IO ports
- Working temperature: -40°C~+105°C
- Working voltage range: 1.7V-5.5V
- With USB port
- High quality-price ratio

■ Application

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

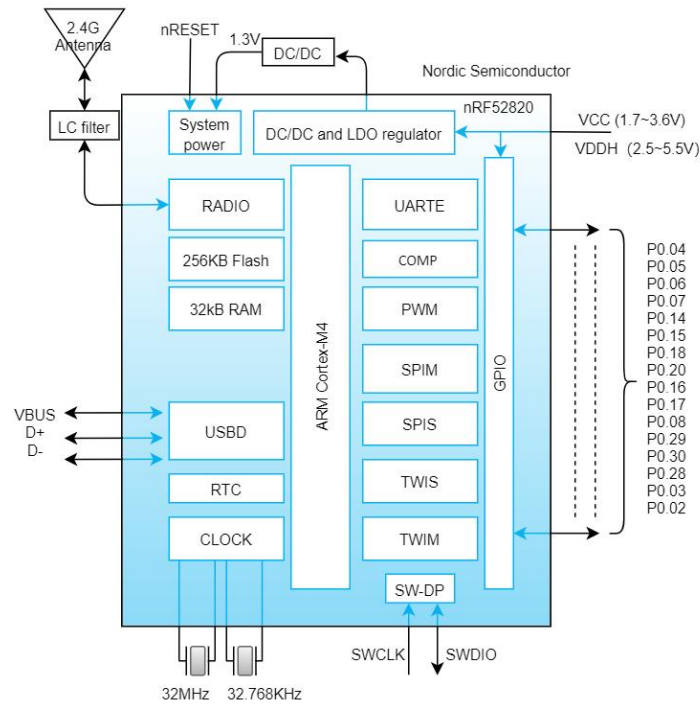
■ Key parameter

Chip Model	nRF52820	Antenna	PCB
Module Size	20×12×2mm	GPIO	16
Flash	256KB	RAM	32KB
Receiving Sensitivity	-95dBm (1Mbps) ; -103dBm (125kbps)	Transmission Power	-40 ~ +8dBm
Current(TX)	0dBm- 4.9mA	Current(RX)	4.7mA

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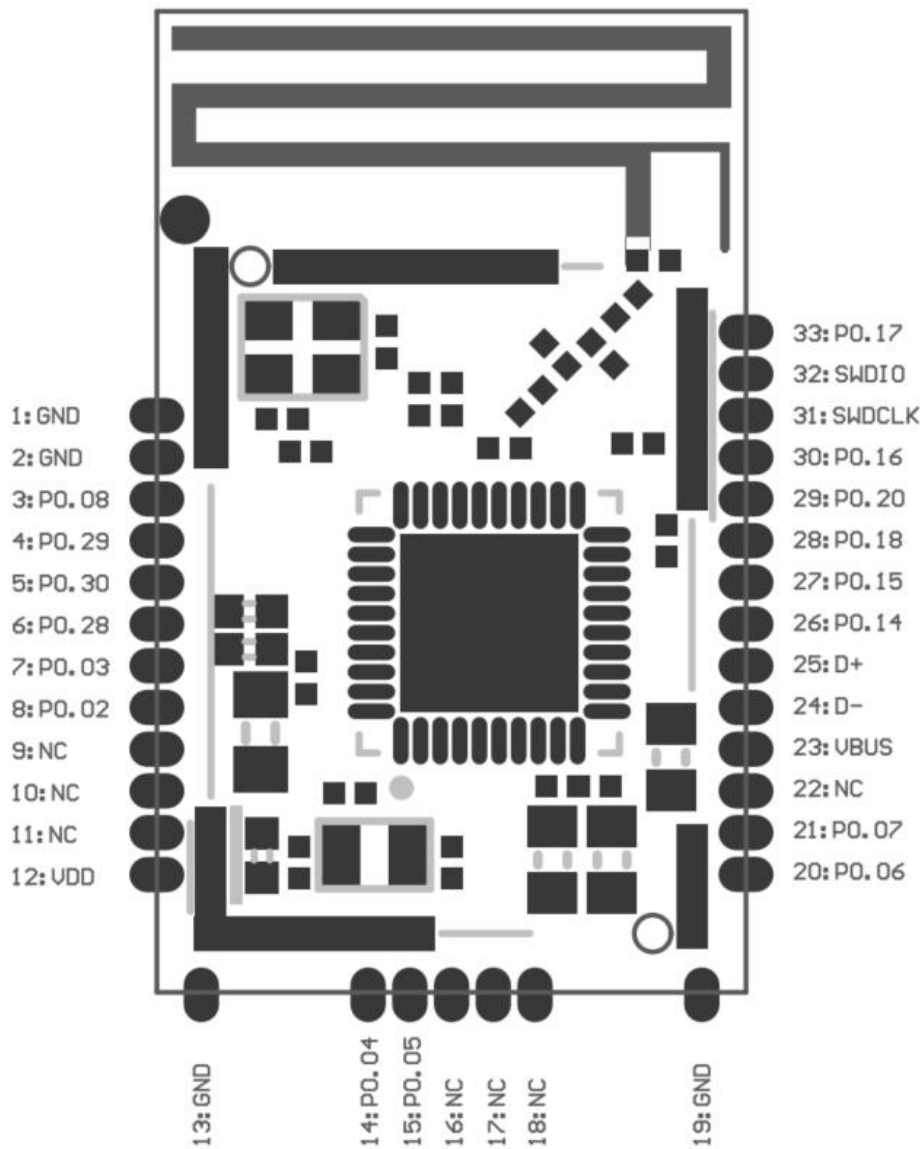
1 Block Diagram



2 Electrical Specification

Parameter	Values	Notes
Working Voltage	1.7V-5.5V	To ensure RF work, supply voltage suggest not lower than 2.3V
Working Temperature	-40°C~+105°C	Storage temperature is -40°C~+125°C
Transmission Power	-40 ~ +8dBm	Configurable
Current(RX)	4.9mA	RF receiving current under 1Mbps pattern
Current(TX)	4.7mA	RF transmission current under 0dB pattern
Module Dimension	20*12*2mm	
Quantity of IO Port	16	

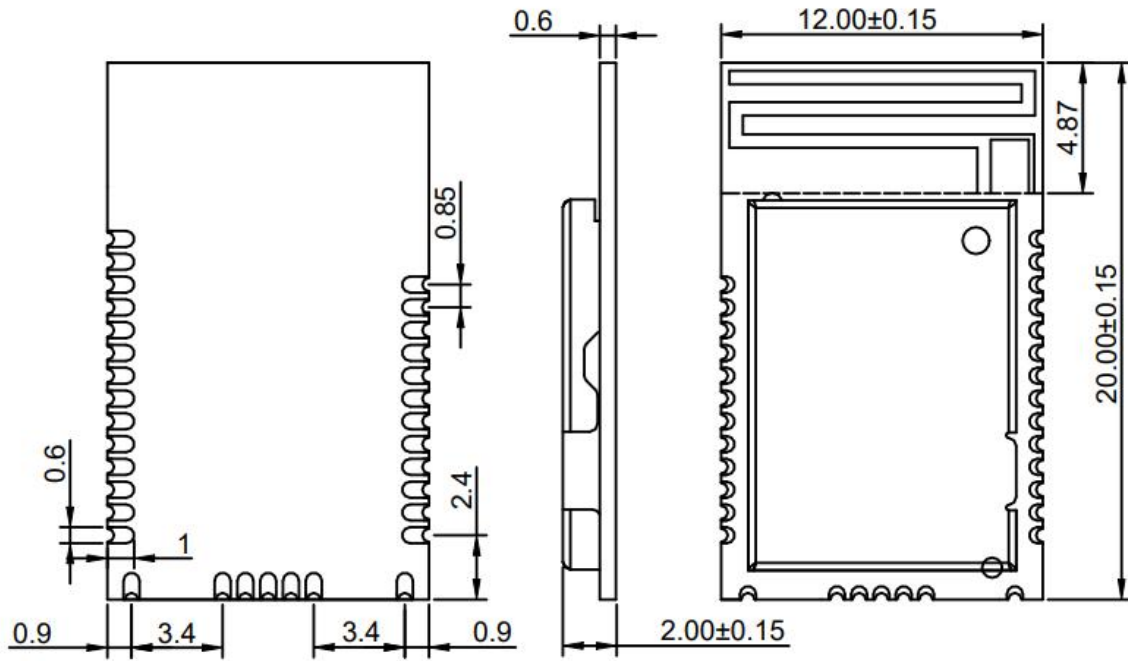
3 Pin Description



4 Pin Definition

Pin Number	Symbol	Type	Definition
12	VDD	Power	Power supply 1.7-5.5V
1/2/13/19	GND	Power	Ground
31	SWDCLK	Debug	Serial wire debug clock input for debug and programming
32	SWDIO	Debug	Serial wire debug I/O for debug and programming
3-8/14-15/20-21/26-30/31	P0.00 to P0.30	Digital I/O	General purpose I/O, Where P0.02, P0.03, P0.04, P0.05 are analog input pins that can be used as ADCs
25	D+	USB	USB D+
24	D-	USB	USB D-

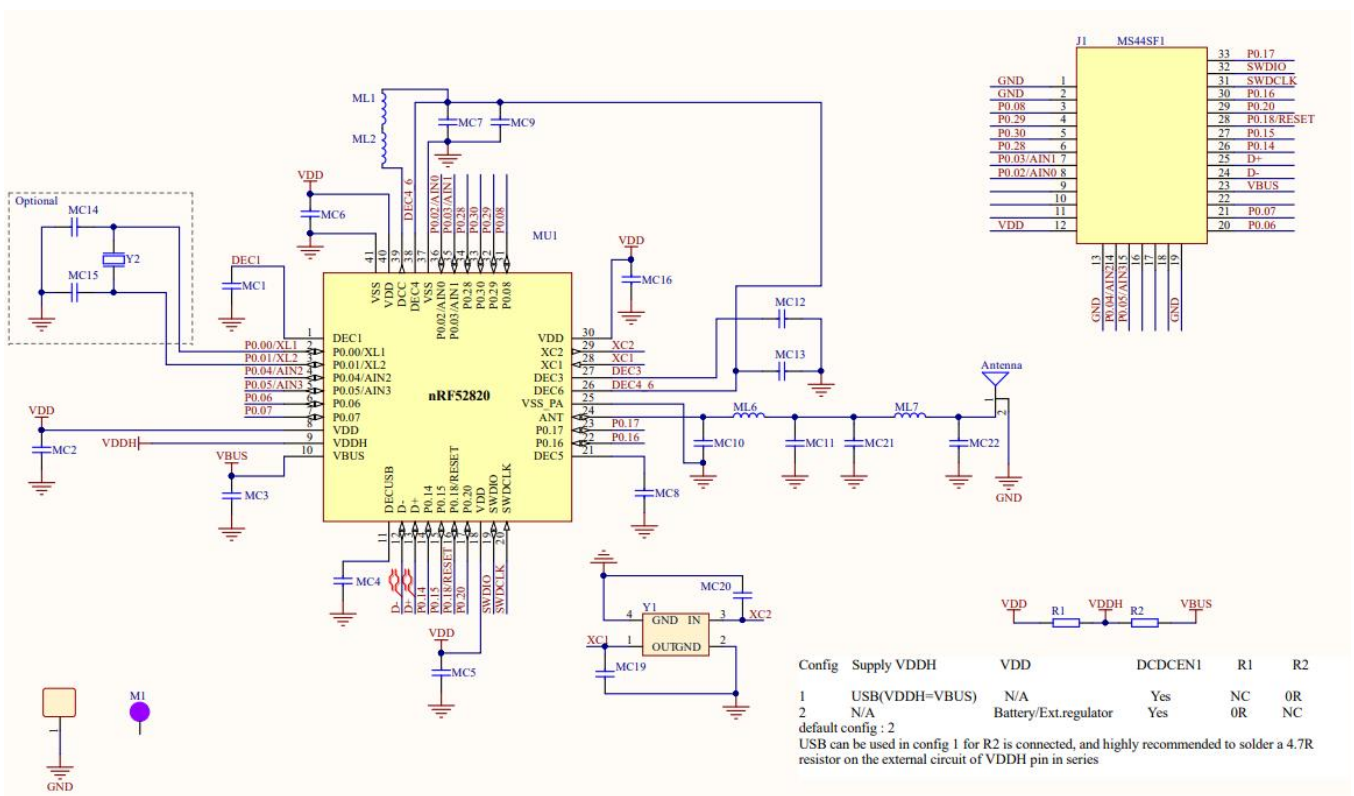
5 Mechanical Drawing



* (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

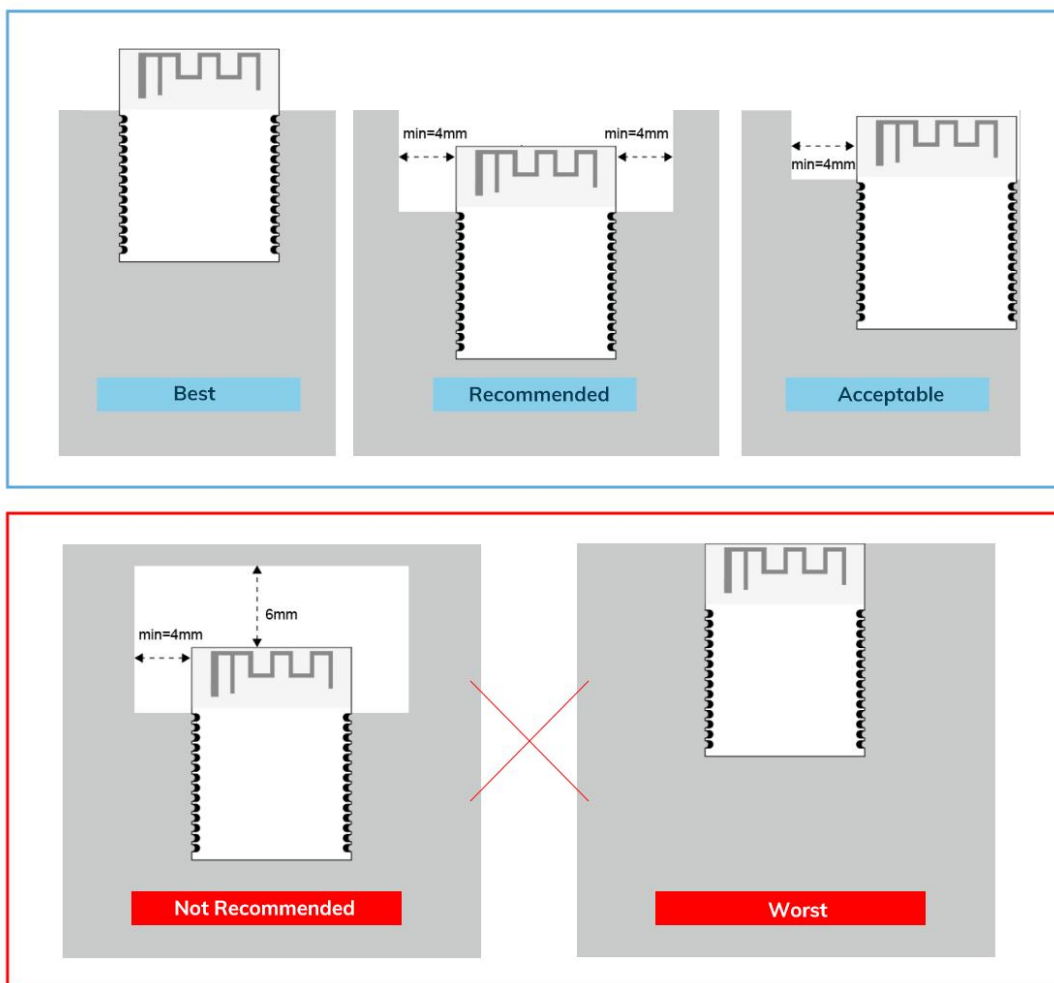


Notice: Before placing an order, please confirm the specific configuration required with the salesperson.

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.



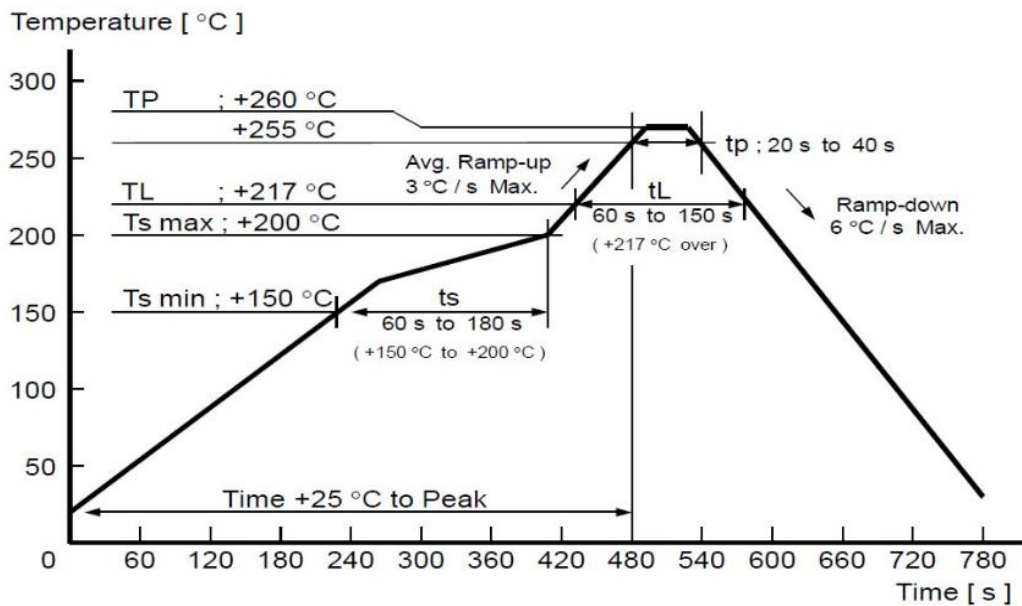
Layout notes:

- 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

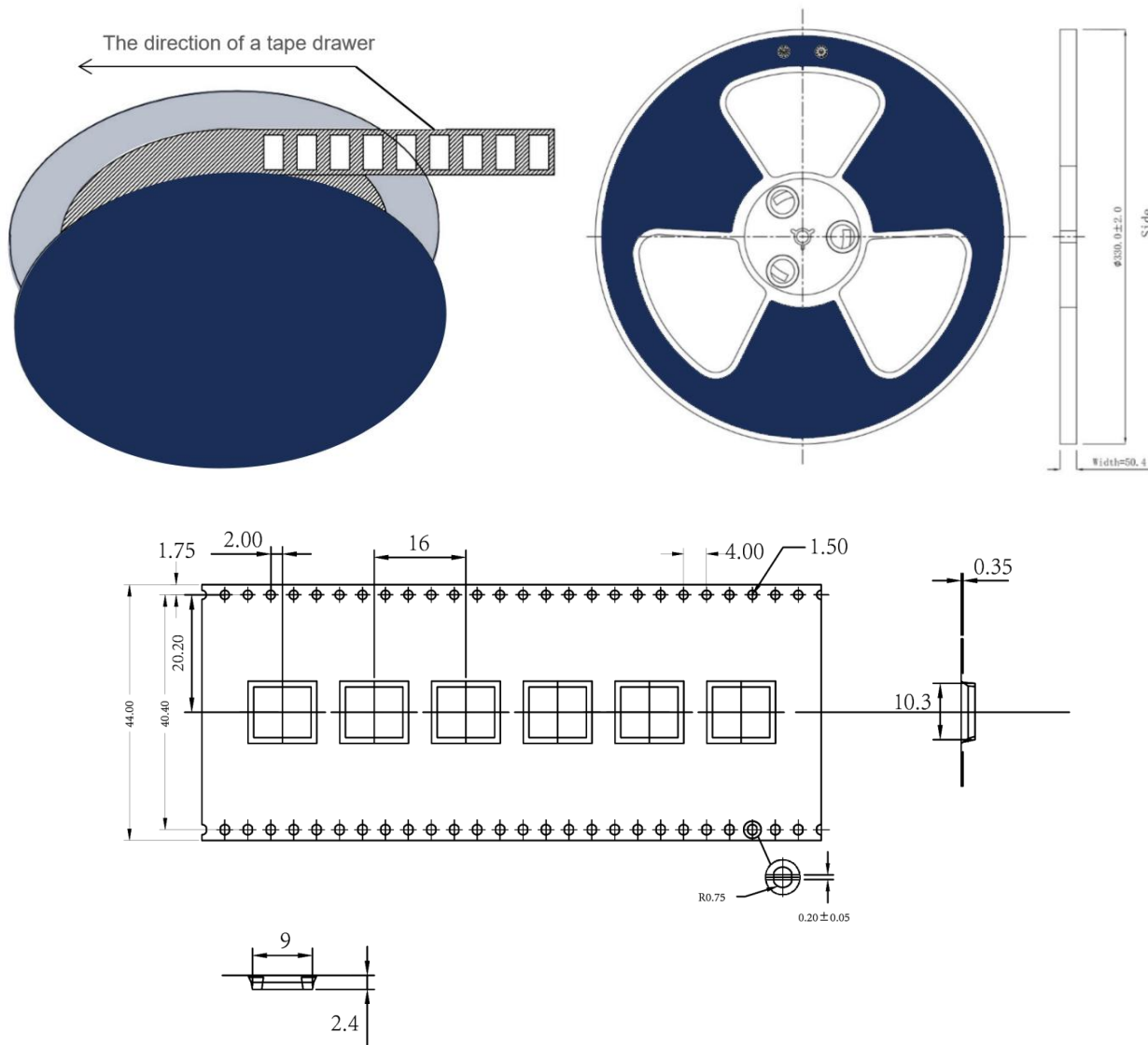
1) Do SMT according to above reflow oven temperature deal curve. Max. Temperature is 260°C;

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: ± 0.1)

Packing detail	Specification	Net weight	Gross weight	Dimension
Quantity	850PCS	525.9g	1092g	W: 44mm,T:0.35mm

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

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The company has its own factory, advanced production equipment, and a refined quality management system. It has passed ISO9001 quality system certification, ISO14001 environmental management system certification, ISO27001 information security management system certification, OHSAS18001 occupational health and safety management system certification, and BSCI commercial and social standard certification. Each product has undergone emission power testing, sensitivity testing, power consumption testing, stability testing Strict testing such as aging testing. The fully automated modular production line has been officially put into use, with a production capacity of one million tons, meeting the needs of multi output production.

● Contact Us

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Related Documents: Chip Specification

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