

UWB

MS01SF1

Datasheet

V 1.1.0

Applicable Product Model
MS01SF1-nRF52833+DW3120

Version Note

Version	Details	Contributor(s)	Date	Notes
1.0.0	First edit	Coral	2022.05.21	
1.1.0	Layout Changes	Michelle	2023.08.30	

MS01SF1-nRF52833+DW3120

Ranging Transmission, UWB Dual Channel Available, Bluetooth 5.2+UWB Module with Acceleration Sensor



Chip+PCB

MS01SF1 is a UWB high-precision wireless distance measurement module, using Nordic high-end nRF52833 Bluetooth chip as the main control, through Bluetooth to Decawave high-precision distance measurement chip DW3120 parameter settings and control the DW3120 to carry out the distance measurement operation, to obtain the corresponding results, and then to the cell phone or other host devices, and with acceleration sensor, can meet the needs of industrial intelligence and other scenarios. nRF52833 open 23 IO ports can be configured as UART, SPI, I2C, smart city, public inspection and justice. The nRF52833 can meet the needs of industrial intelligence, safety production, warehousing and logistics, smart city, public prosecutors and law enforcement agencies, etc. The nRF52833 is open to 23 IO ports, which can be configured as UART, SPI, I2C, PWM and other interfaces, which is convenient for the secondary development of the customer.

■ Features

- Bluetooth 5.2 + UWB
- Positioning accuracy 10-30cm
- Maximum 6.8Mbps Transmission Rate
- UWB distance 80m
- UWB dual channel available
- With USB port
- With accelerometer

■ Application

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

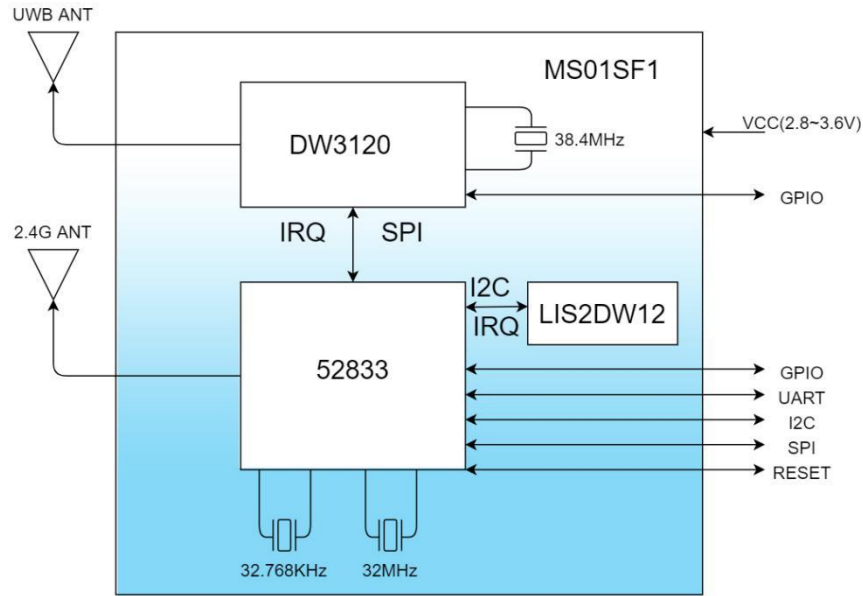
■ Key parameter

Chip Model	Nordic nRF52833 Decawave DW3120	Antenna	Chip+PCB
Module Size	26.12×19.13×3.2mm	GPIO	BLE:23 + UWB:4
Flash	512KB	RAM	128KB
BLE Receiving Sensitivity	-96dBm	BLE Transmission Power	-40 ~ +8dBm
BLE Current(TX)	0dBm- 4.6mA	BLE Current(RX)	4.8mA
UWB Receiving Sensitivity	-94dBm	UWB Current(RX)	55mA
UWB Current(TX)	140mA		

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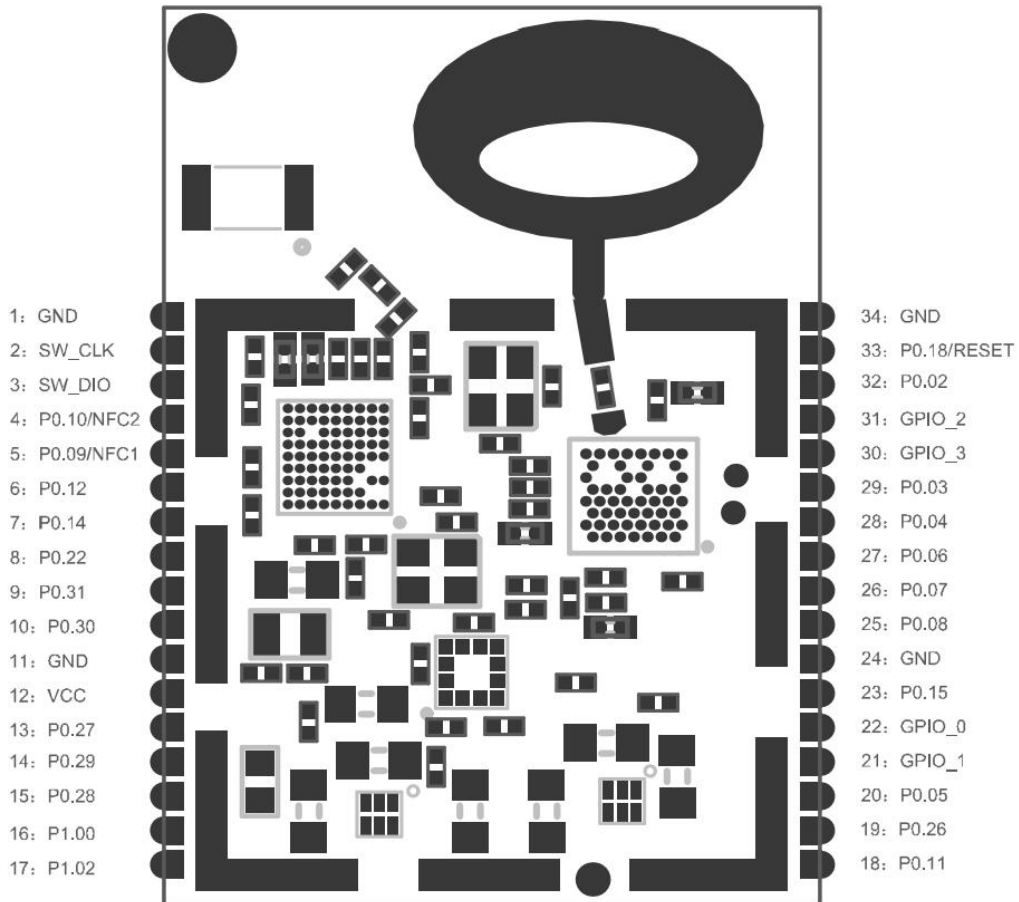
1 Block Diagram



2 Electrical Parameters

parameters	minimum value	classical values (math.)	maximum values	unit (of measure)	note
operating temperature	-30		+85	°C	
Storage temperature	-40		+85	°C	
Supply Voltage VCC	2.8		3.6	V	
Sleep Current		0.05		mA	deep sleep
TX Current		140		mA	Channel 5
Bluetooth TX Current		14		mA	
RX Current		55		mA	
frequency range	6240	6489.6	6739.2	MHz	Channel 5 Center Frequency
		7987.2		MHz	Channel 9 Center Frequency
Measuring distance	30		80	m	Transmission rate: 6.8 Mbps

3 Pin Description

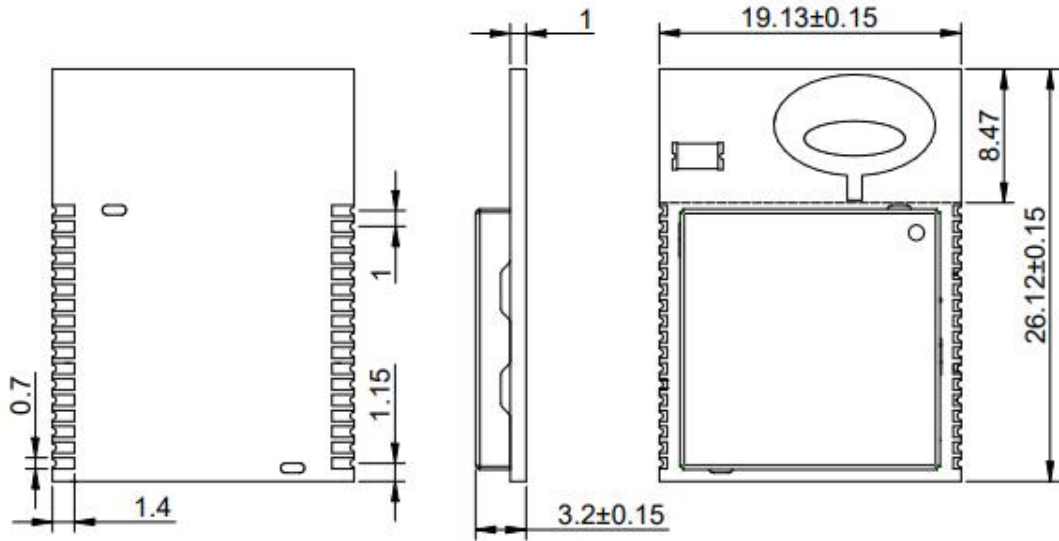


4 Pin Definition

Pin Number	Pin Symbol	Pin Type
1	GND	GND
2	SWDCLK	nRF52833 burn-in clock pins
3	SWDIO	nRF52833 burn data pins
4	P0.10	nRF52833 General Purpose IO Port
5	P0.09	nRF52833 General Purpose IO Port
6	P0.12	nRF52833 General Purpose IO Port
7	P0.14	nRF52833 General Purpose IO Port
8	P0.22	nRF52833 General Purpose IO Port
9	P0.31	nRF52833 general-purpose IO port/ADC pinout
10	P0.30	nRF52833 general-purpose IO port/ADC pinout
11	GND	GND
12	VCC	Power supply pin: 2.8V~3.6V
13	P0.27	nRF52833 General Purpose IO Port
14	P0.29	nRF52833 General Purpose IO Port
15	P0.28	nRF52833 General Purpose IO Port
16	P1.00	nRF52833 General Purpose IO Port
17	P1.02	nRF52833 General Purpose IO Port
18	P0.11	nRF52833 General Purpose IO Port
19	P0.26	nRF52833 General Purpose IO Port
20	P0.05	nRF52833 General Purpose IO Port
21	GPIO_1	General purpose IO ports on the DW3120
22	GPIO_0	General purpose IO ports on the DW3120

23	P0.15	nRF52833 General Purpose IO Port
24	GND	GND
25	P0.08	nRF52833 General Purpose IO Port
26	P0.07	nRF52833 General Purpose IO Port
27	P0.06	nRF52833 General Purpose IO Port
28	P0.04	nRF52833 General Purpose IO Port
29	P0.03	nRF52833 General Purpose IO Port
30	GPIO_3	General purpose IO ports on the DW3120
31	GPIO_2	General purpose IO ports on the DW3120
32	P0.02	nRF52833 General Purpose IO Port
33	P0.18	nRF52833 general purpose IO port/reset pin
34	GND	GND

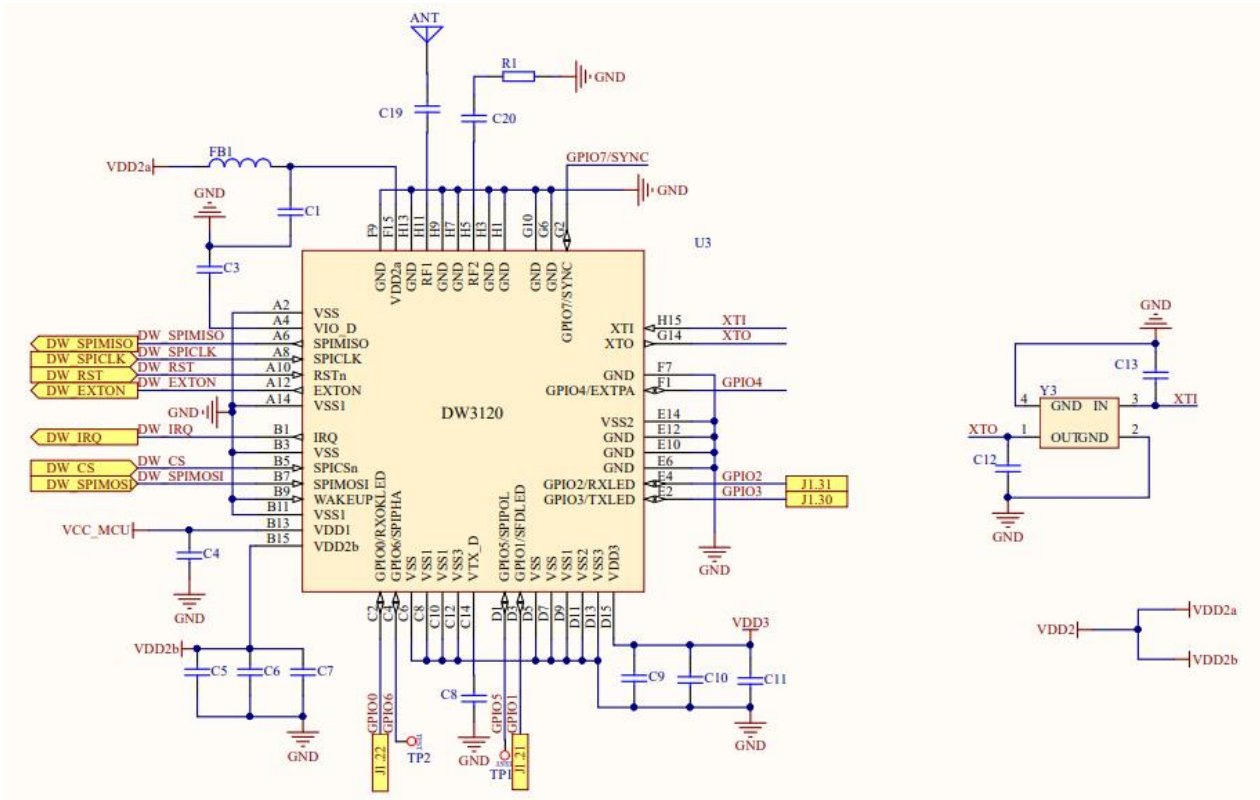
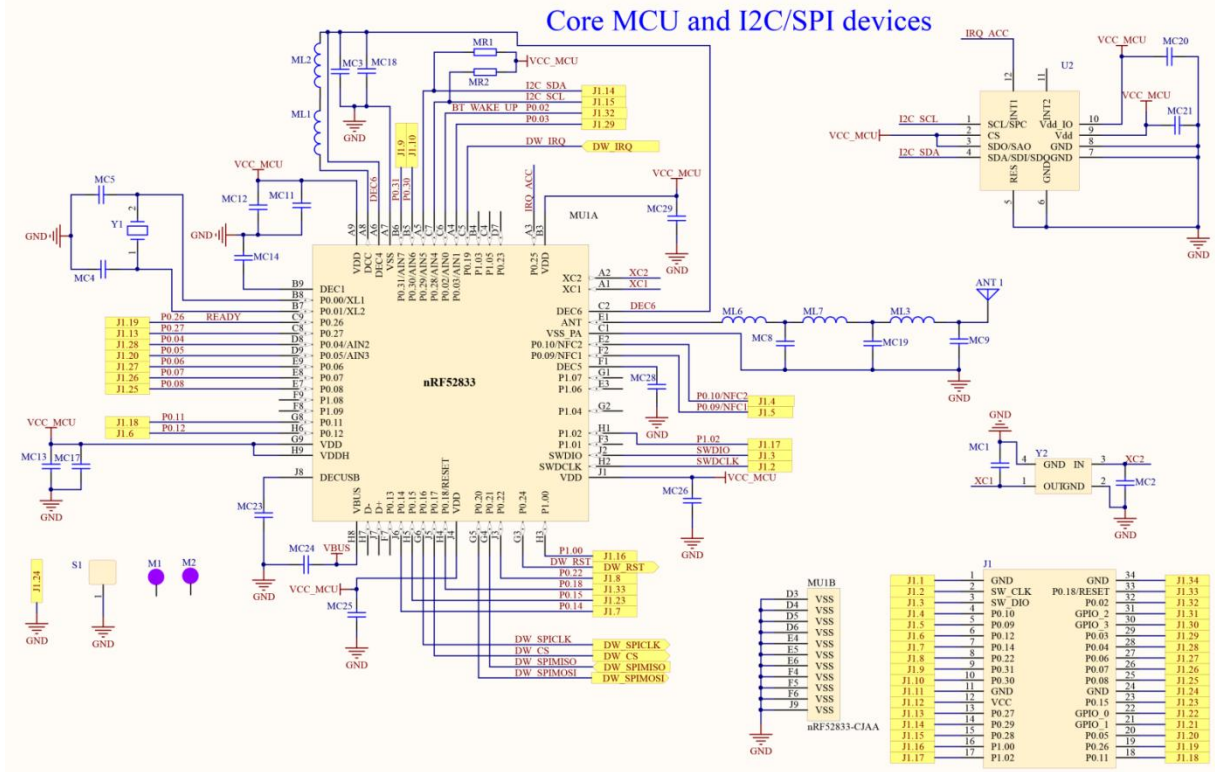
5 Mechanical Drawing

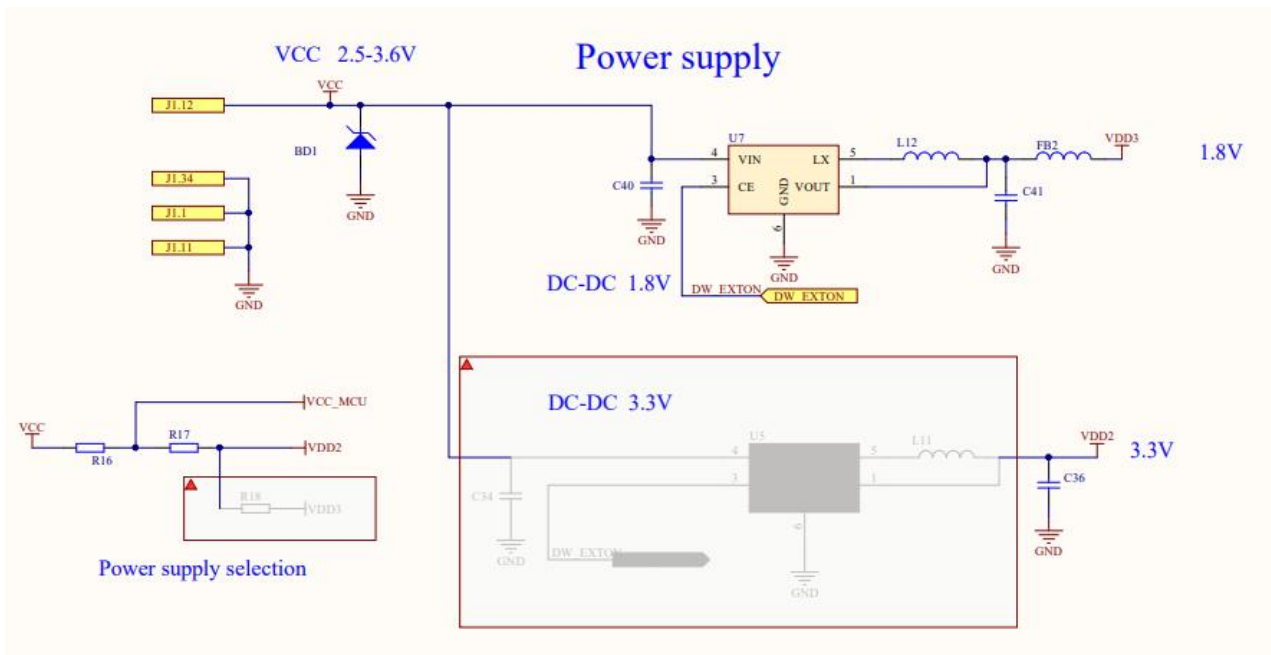


* (Default unit: mm Default tolerance: ±0.1)

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

6 Electrical Schematic

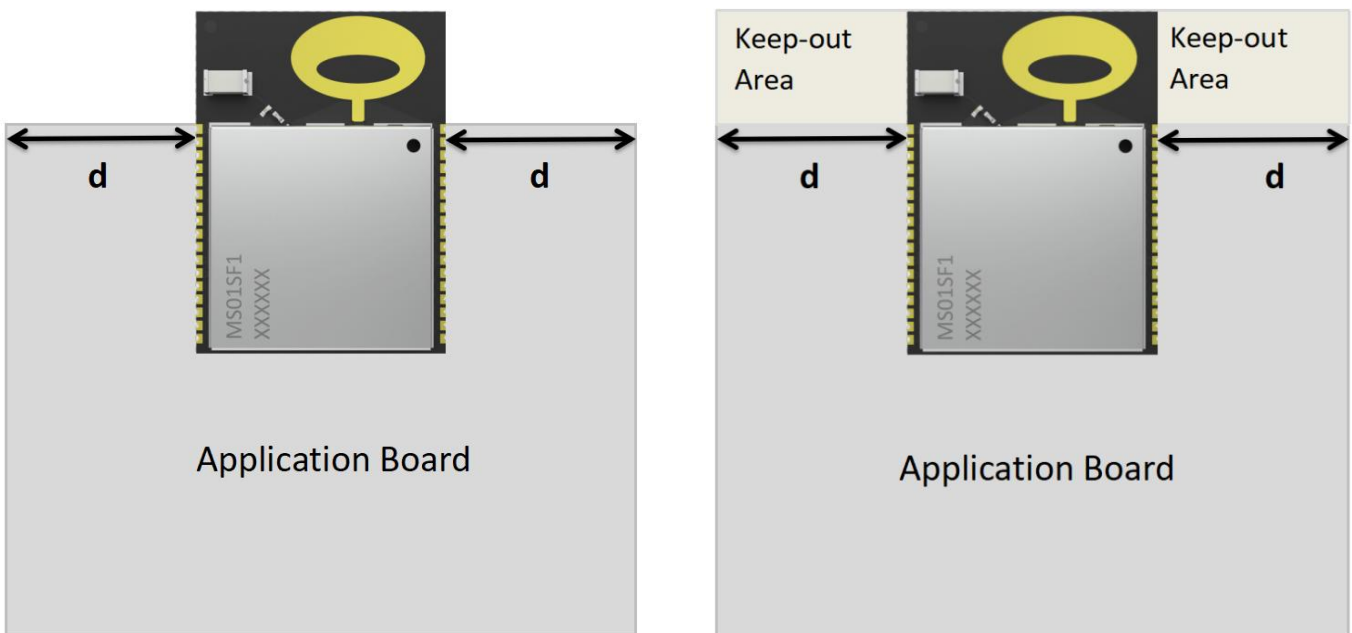




Notice: Before placing an order, please confirm the specific configuration required with the salesperson.

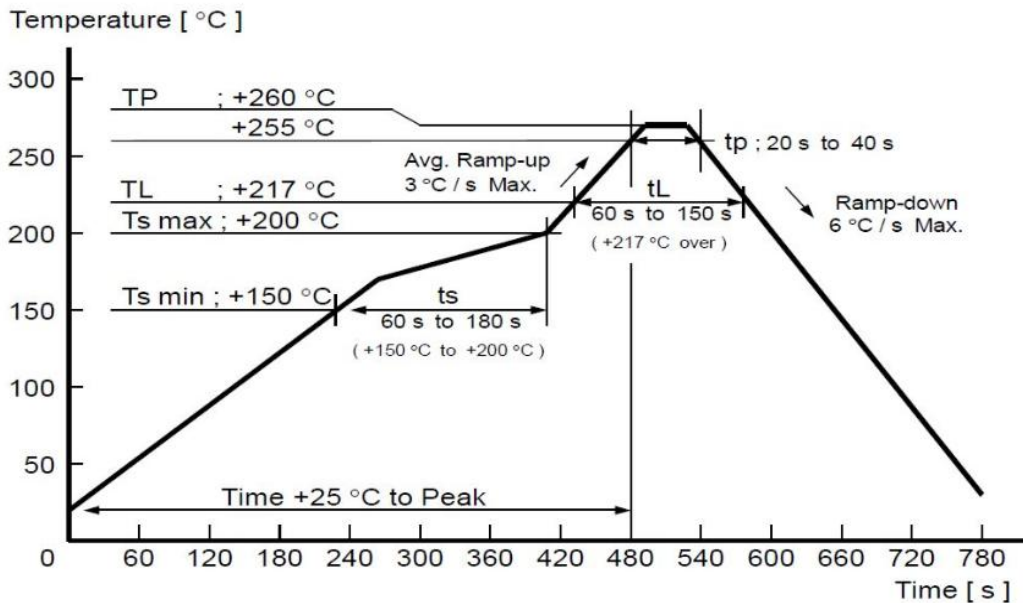
7 PCB Layout

The proximity of the UWB module antenna to metal and other non-RF transparent materials needs to be carefully considered when soldering the UWB module to the top of the PCB. The following is a recommended placement scheme for UWB modules, as shown in the figure. For optimal RF performance of the module, the application board grounding copper cladding should cover as much area as possible, except for the area labeled "Keep-out Area". There should be no metal on either side, above or below the module antenna. (e.g. do not place batteries under the antenna). For both placement options shown, the application board has no metal in the module antenna area. For the diagram on the left, the antenna extends out of the application board from the edge, leaving the module antenna area in free space. In the diagram on the right, the module antenna is not in free space, but the sides and underside of the application board where the module antenna is located are netted without PCB copper skins. In addition, the grounding area of the application board affects the radiation effect diagram of the module antenna. (It is recommended that no metal exists within a minimum distance of $d=10\text{mm}$ on either side of the module antenna).



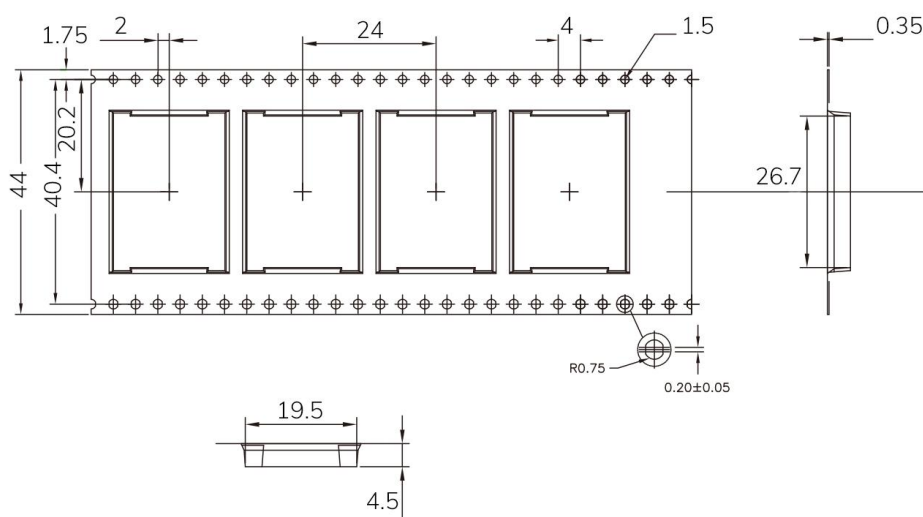
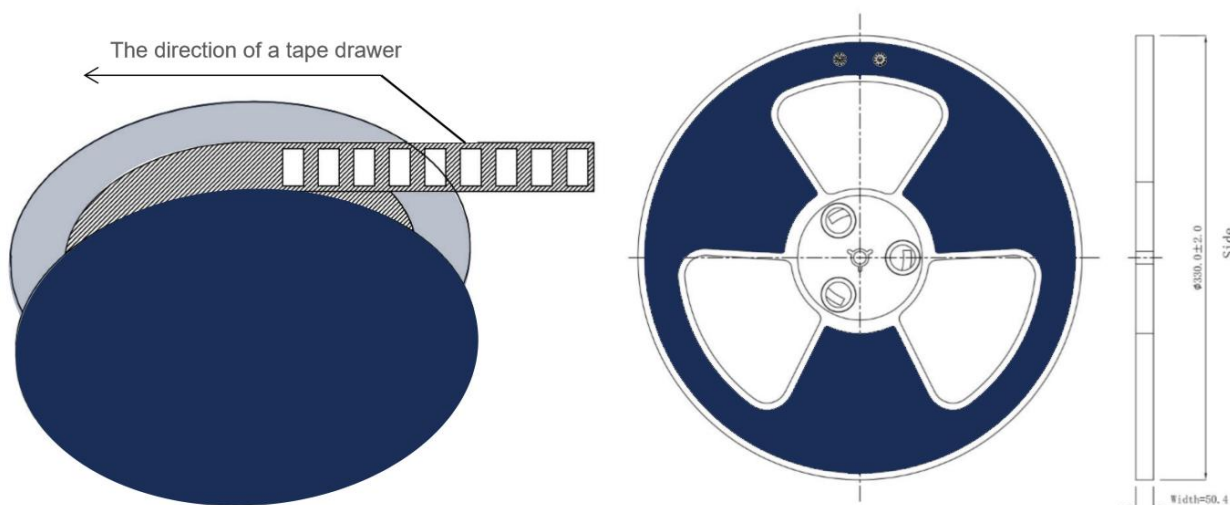
8 Production recommendations

- 1) SMT based on the above reflow oven temperature profile. 260°C max.;
- 2) Refer to IPC/JEDEC standards; peak temperature: <260 °C; number of times: ≤ 2 times, SMT involves double-sided patch recommended module face only once over the reflow soldering, if there is a special process can be contacted our company.



- 3) Module SMT is recommended to do a local step stencil thickness of 0.2mm, and then open the enclosure extension of 0.8mm;
- 4) 4) After opening, one time use is not finished, to vacuum preservation. Can not be exposed to air for a long time to prevent moisture, pad oxidation; if there is an interval of 7 to 30 days in the middle, and again before using on-line SMT, it is recommended to not remove the braided tape at 65-70 degrees baking for 24 hours;
- 5) Electrostatic discharge (ESD) protection measures should be taken before using SMT.

9 Package Information



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

Packing detail	Specification	Net weight	Gross weight	Dimension
Quantity	550PCS	1038g	1508g	W: 44mm,T:0.35mm

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

● Quality

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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