

# LoRaWAN Module

**MS25LS01**

**Datasheet**

V 1.0.0

**Applicable Product Model**

ME25LS01

# Version Note

Version	Details	Contributor(s)	Date	Notes
1.0.0	First edit	Vinle	2024.02.29	

# ME25LS01-LR1110+nRF52840

**High-performance, long-range, small-size, ultra-low-power, supports WiFi-scan/GNSS/ BLE/LoRaWAN multi-protocol**



The ME25LS01 is a ultra-low-power, high-performance, small-sized module that supports Wi-Fi Scan, GNSS (GPS/BDS), BLE5.3, LoRaWAN and other multi-protocols, and has a large storage capacity of 512KB RAM and 1MB Flash. ME25LS01 has better receiving sensitivity, with BLE as low as -96dBm and LoRa as low as -125.6dBm. At the same time, the maximum power of BLE is 6dBm and the maximum power of LoRa is 22dBm, which can meet the needs of longer transmission distance. The module power supply voltage is 3.3V, with abundant GPIO, ADC, Uart, I2C, NFC, etc. It has a completely open source development platform to support customers' secondary development and customization needs.

## ■ Features

- Cortex M4 high performance MCU
- Low power, dual low power chip combination
- BLE 5.3, supports BLE long-range
- Abundant IO ports, USB, Uart, I2C, etc
- With a completely open-source development platform, which supports customers' secondary development and customization needs.

## ■ Application

- Agricultural automation
- Asset tracking
- Inventory management
- Livestock tracking

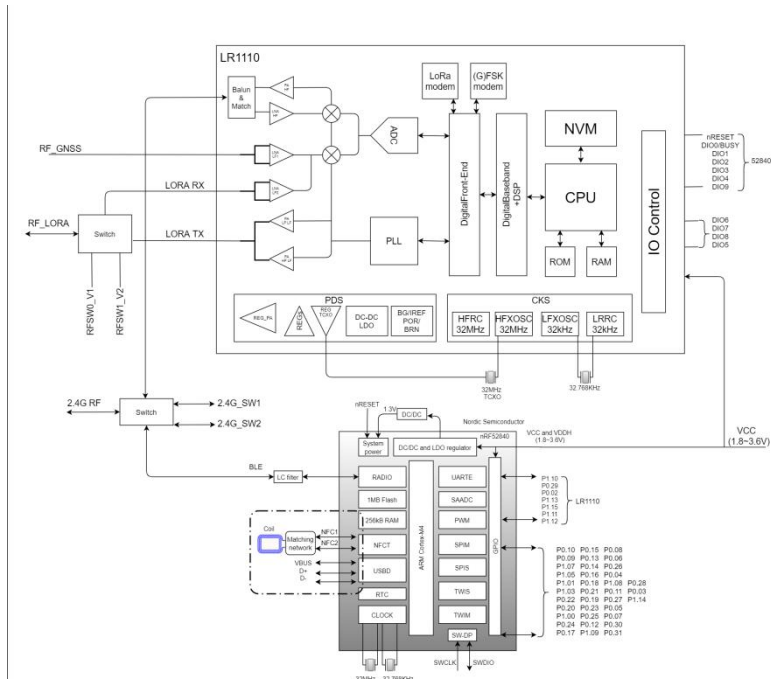
## ■ Key Parameter

<b>Chip Model</b>	LR1110+nRF52840	<b>Antenna</b>	ANT pin
<b>Module Size</b>	25.5x20x2.6mm	<b>GPIO</b>	44
<b>Flash</b>	1MB	<b>RAM</b>	512KB
<b>Receiving Sensitivity</b>	BLE: -96dBm LoRa: -125.6dBm	<b>Transmission Power</b>	BLE:-40-+8dBm LoRa: 22dBm
<b>Current(TX)</b>	Max- 118mA	<b>Current(RX)</b>	Max-10.7mA

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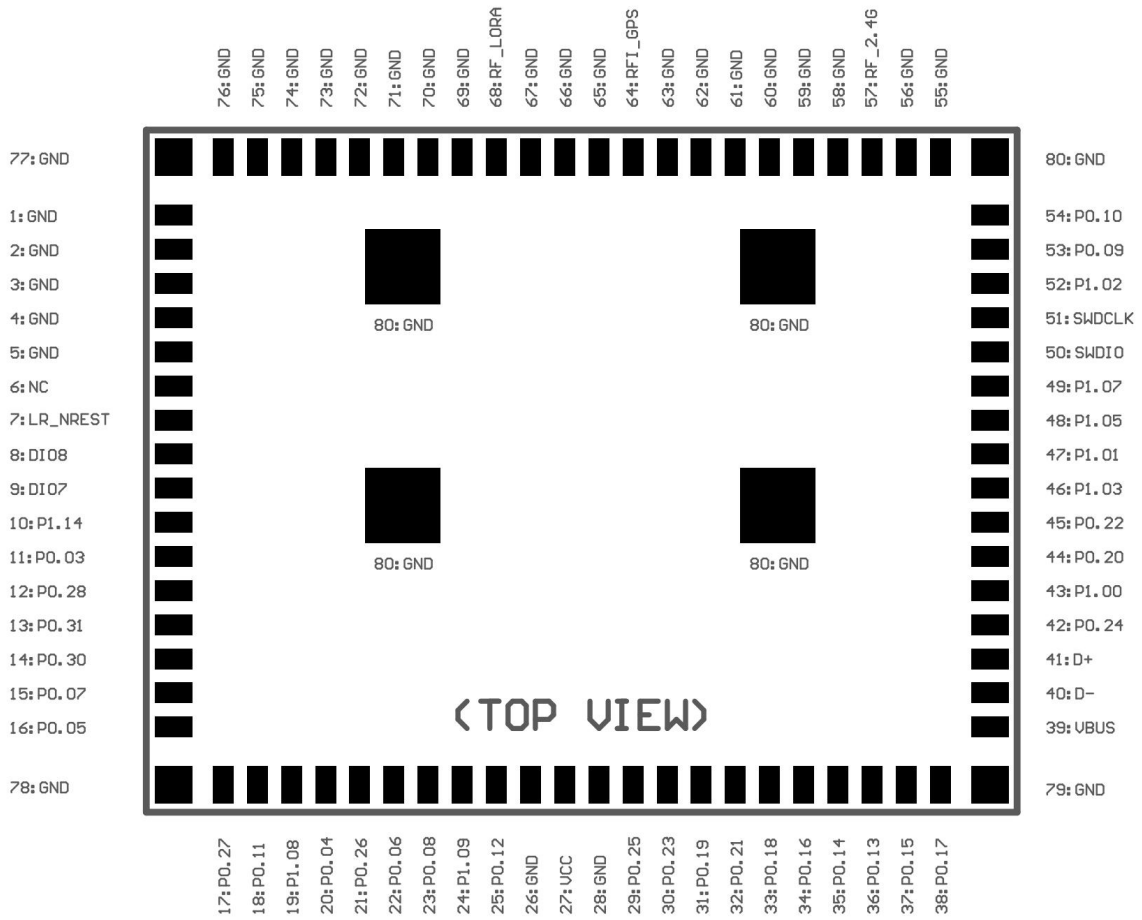
# 1 Block Diagram



# 2 Electrical Specification

Parameter	Values	Notes
Operating Voltage	1.7V-5.5V	Standard power supply voltage 3.3V
Working Temperature	-40°C~+85°C	Storage temperature is -40°C~+125°C
Operating Frequency	LoRa: 150MHz - 960MHz GNSS: GPS L1, BDS B1	LoRa: support 868MHz/915MHz
Transmission Power	BLE: -40 ~ +8dBm LoRa: +22dBm	Configurable
Current(RX)	10.7mA	Max receiving current
Current(TX)	118mA	Max transmission current
Module Dimension	25.5*20*2.6mm	
Quantity of IO Port	44	I2C、UART、USB、SPI etc.

### 3 Pin Description



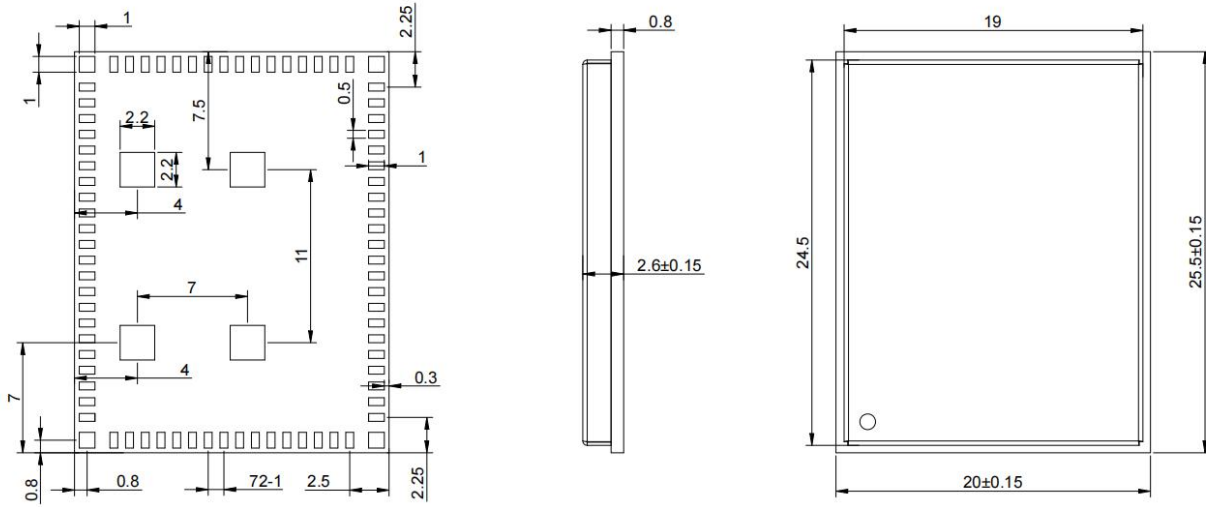
<TOP VIEW>

**Top View**

## 4 Pin Definition

Symbol	Type	Definition
VCC	Positive power supply	Power supply, 1.7V-3.6V, with this pin
VBUS	Power supply	Power supply conversion access required for USB port
GNS	Negative power supply	Grounded
SWCLK/SWDIO	I/O, Debug pin	I/O pin multiplexing, debug pin. During debugging, only connect this pin with the power and ground pins:
P0.03-P0.31 P1.00-P1.03 P1.07-P1.09- P1.05/P1.14 DIO7-DIO8	GPIO	General IO port
D+	Digital interface	USB D+
D-	Digital interface	USB D-
LR-NREST	Reset	LoRa Reset
RF-LORA	External antenna pin	LoRa antenna pin
RF-GPS	External antenna pin	GNSS antenna pin(GPS/BDS)
RF-2.4G	External antenna pin	2.4G antenna pin
NC	NC	Empty pin

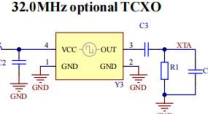
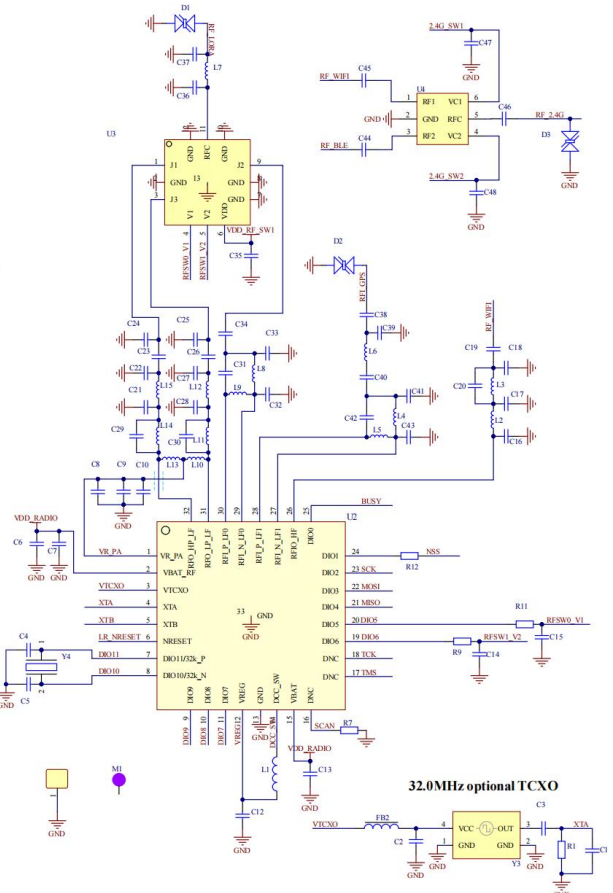
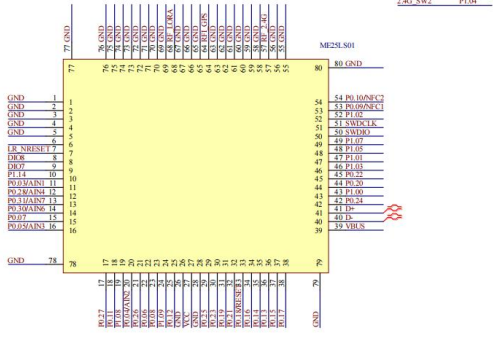
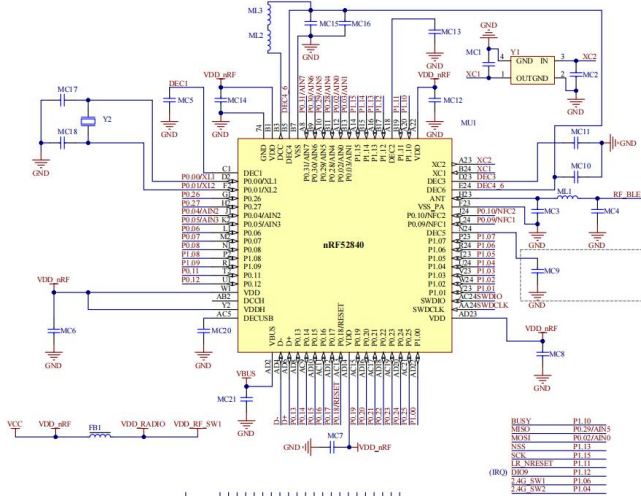
## 5 Mechanical Drawing



\* (Default unit: mm      Default tolerance:  $\pm 0.15$ )



# 6 Electrical Schematic



## 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.

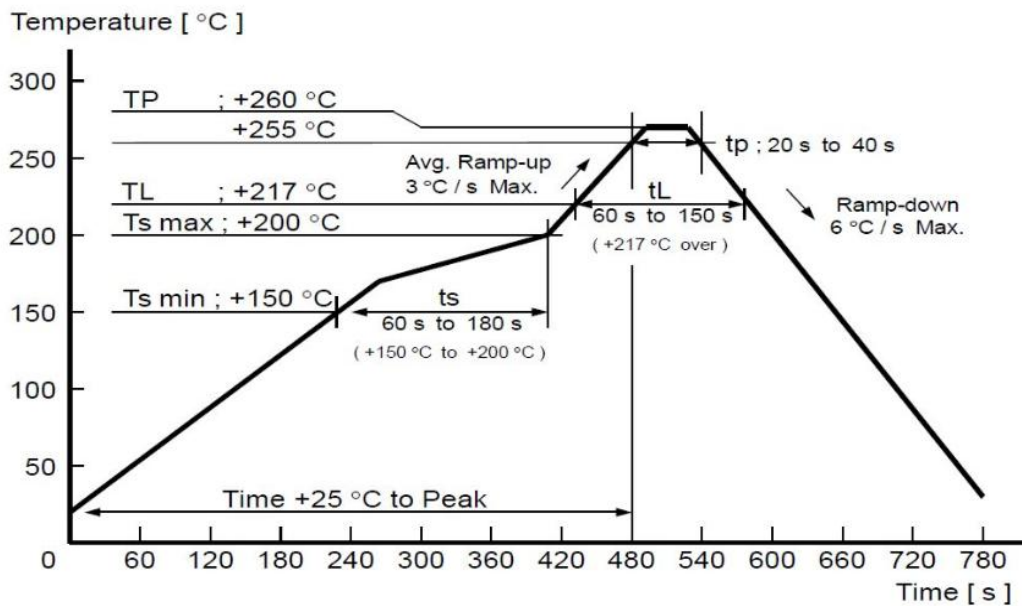
### Layout Notes:

- 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

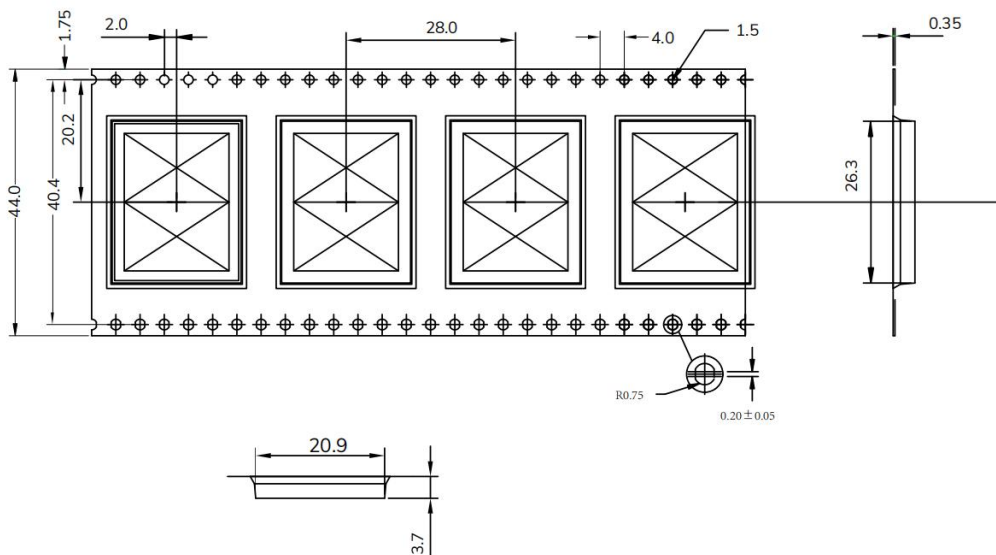
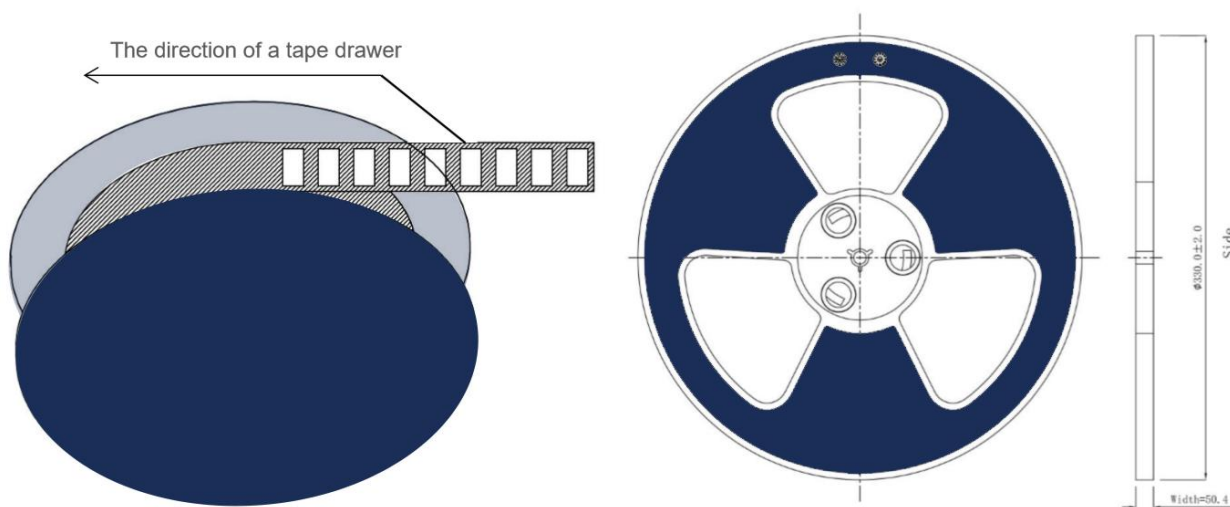
1) Do SMT according to above reflow oven temperature deal curve. Max. Temperature is 260°C;

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	620PCS	-	-	W=44mm, T=0.35mm

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

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