MINEWSEMI

Low Power NearLink Combo Module

ME15SS02

Datasheet

V 1.0.0

Version Note

Version	Details	Contributor(s)	Date	Notes
1.0.0	First edit	Vincle	2025.03.18	

Part Number

Model	Hardware Code
ME15SS02	1N10TI

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https://en.minewsemi.com/file/ME15SS02-TR5310_Datasheet_K_EN.pdf

ME15SS02-TR5310

High-sensitivity, ultra-low-power, large memory capacity, supports SLE1.0 & BLE 5.4 multi-protocols, and features rich peripheral interfaces

The ME15SS02 is a high-sensitivity, ultra-low-power 2.4GHz multi-protocol wireless NearLink module. It features an RISC-V MCU with a core running at up to 64 MHz. The module includes 1MB of flash memory, 128KB of SRAM, and an integrated 2.4GHz SLE 1.0 & BLE 5.4 transceiver, along with other powerful supporting resources, making it an ideal solution for both Bluetooth and NearLink connectivity. At a data rate of 1 Mbps, the communication range can reach up to 200 meters in open space.

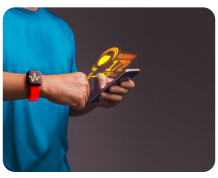
FEATURES

- NeraLink SLE1.0 &BLE 5.4
- Supports high data throughput, with a maximum physical data rate of up to 12 Mbps
- Ultra-low-power consumption, only 90μA during normal operation
- Default onboard PCB antenna, optional IPEX connector
- Rich peripheral interfaces with 14 GPIOs, compatible with SPI, ADC, UART, I2C, and more
- Ultra-long transmission range of up to 200 meters

KEY PARAMETERS

ME15SS02-TR5310			
Chip Model	TR5310	**Antenna**	PCB/U.FL
Module Size	24×16×3.6mm	**GPIO**	14
Flash	1MB	**RAM**	128KB
Receiving Sensitivity	-96dBm	**Transmission Power**	8dBm
Current(TX)	5.5mA	**Current(RX)**	4.3mA

APPLICATIONS

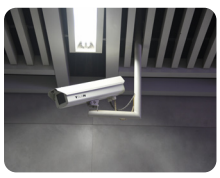


Smart Wearable

HID Devices

Smart Healthcare

Consumer Electronics



Security Equipment

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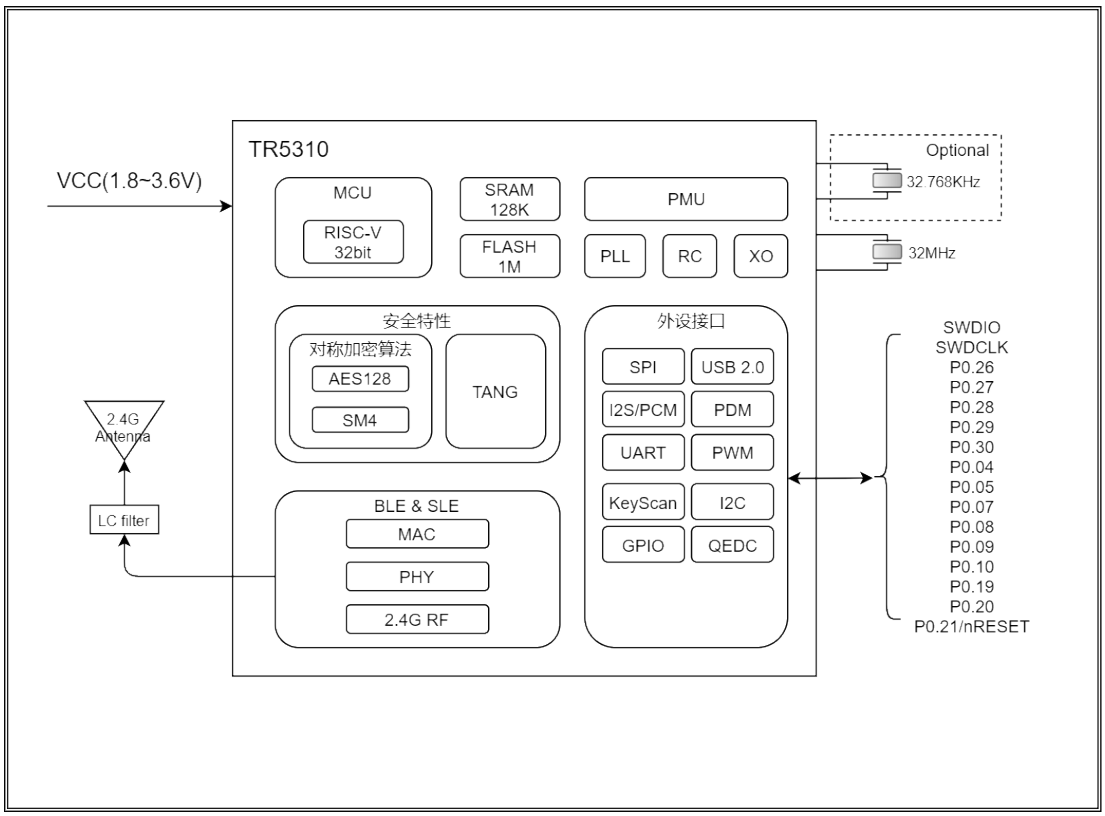
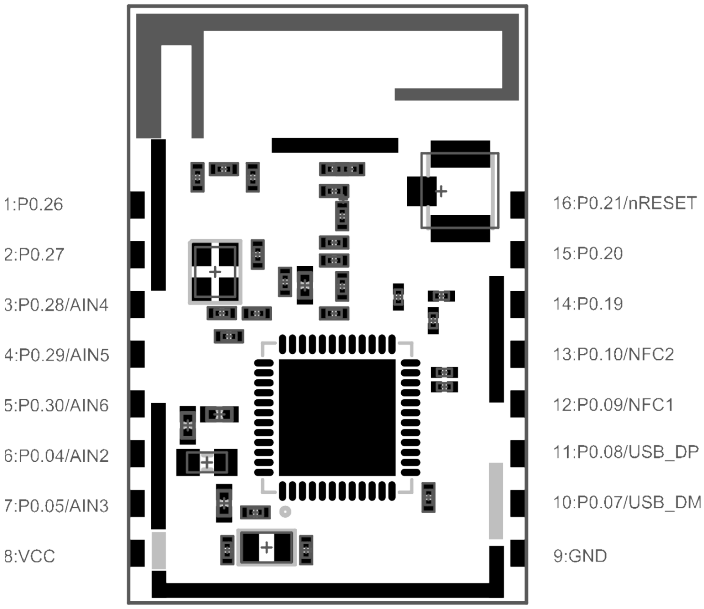
1 BLOCK DIAGRAM



2 ELECTRICAL SPECIFICATION

Parameter	Value	Notes
Working Voltage	1.8V-3.6V	To ensure RF work, the supply voltage should not be lower than 3.3V
Working Temperature	-40℃~+85℃	Storage temperature is -40℃~+105℃
Transmission Power	8dBm	
Current(RX)	4.3mA	RF receiving current in normal receiving mode
Current(TX)	5.5mA@0dB	Max transmit current 50mA
Deep Sleep	10μA	
Module Dimension	24*16*3.6mm	
Quantity of IO Port	14	UART/USB/I2C/PWM/SPI

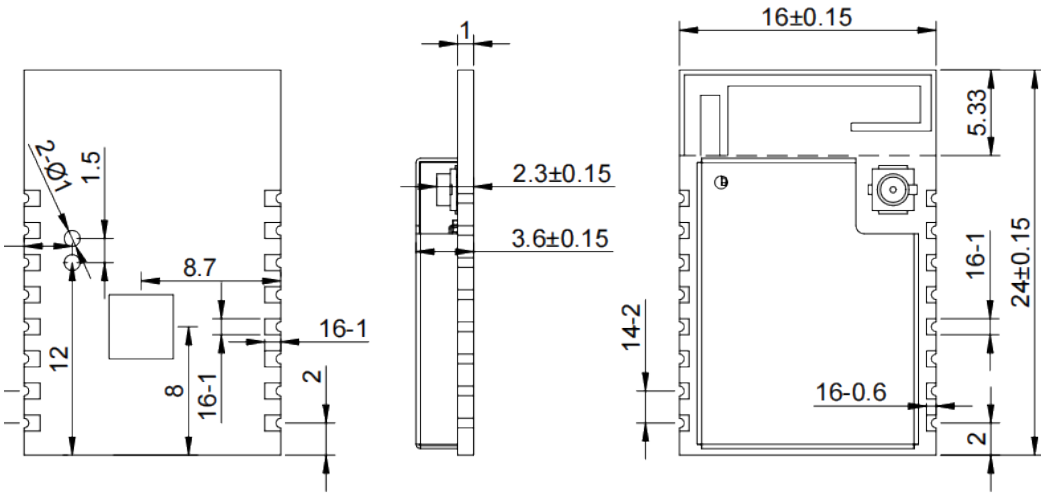
3 PIN DESCRIPTION



4 PIN DEFINITION

Pin Number	Symbol	Type	Definition
8	VCC	Power Supply	Provides power to the module, operating voltage range: 1.8V-3.6V. Standard operating voltage: 3.3V.
16	nRESET	Reset	I/O Pin Multiplexing, Reset
9	GND	Negative power supply	Grounded
1-7/12-15	P0.04-P0.05 P0.09-P0.10 P0.19-P0.20 P0.26-P0.30	GPIO	General IO port
10	USB_DM	Digital Interface	USB DM
11	USB_DP	Digital Interface	USB DP
Download	SWCLK/SWDIO	J-Link programming pin	When programming with J-Link, you only need to connect the power supply pin, ground, and these two pins.

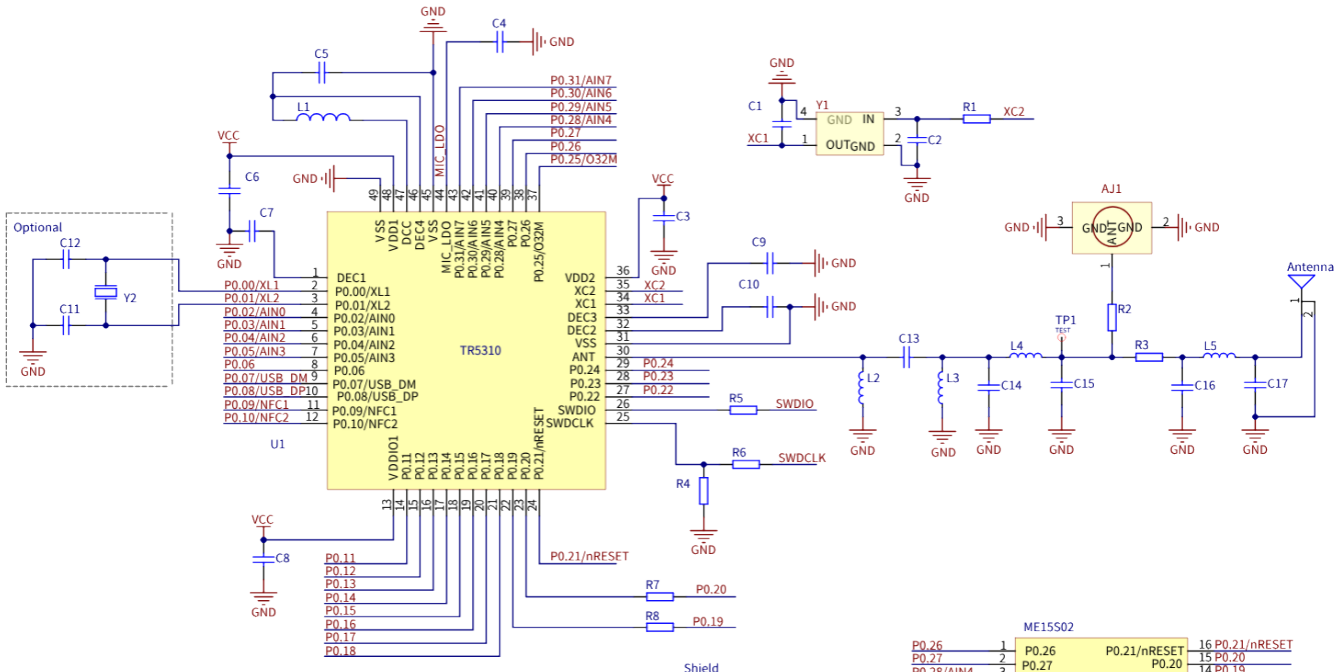
5 MECHANICAL DRAWING



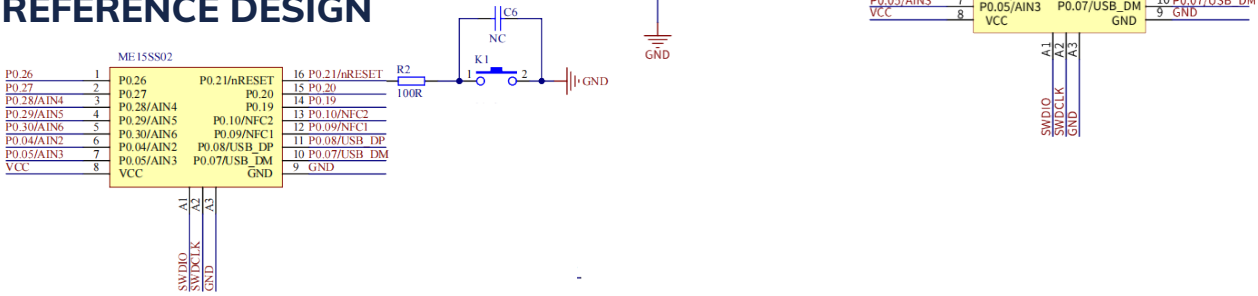
Default unit: mm Default tolerance: ±0.15

Note: Refer to the footprint library for pad design.

6 ELECTRICAL SCHEMATIC



REFERENCE DESIGN



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

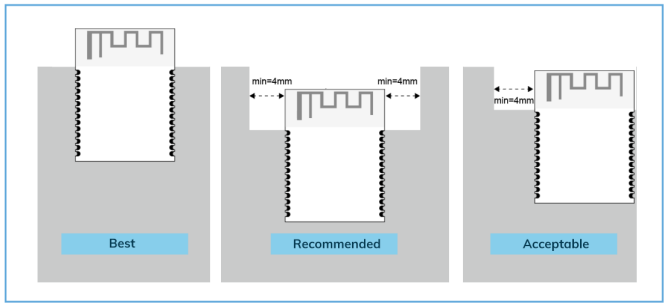
7 PCB LAYOUT

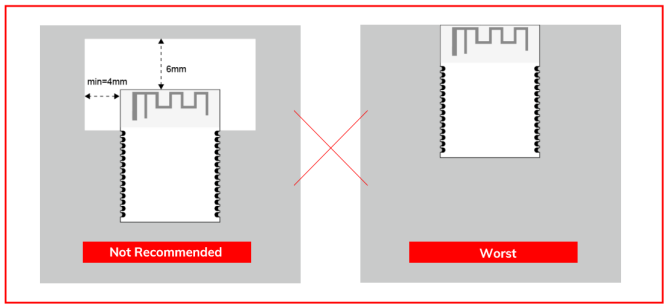
There should be no GND plane or metal cross wiring in the module antenna area, and no components should be placed nearby. It is best to make a hollow or clear area, or place it on the edge of the PCB board. The reference example is as follows:

> Notice: It is strongly recommended to use the first design method. The module antenna design is debugged according to the first wiring.

Layout Notes:

1)The module's antenna area should be completely clear of any metal obstructions to avoid affecting antenna performance (as shown in the diagram).
2)Outside the module's antenna area, try to maintain a solid copper pour to minimize interference from the mainboard signal lines or other sources.
3)A clear area of at least 4mm should surround the module's antenna (including its casing) to reduce interference with the antenna.
4)Ensure good grounding for components to minimize parasitic inductance.
5)Do not place copper under the module's antenna to prevent interference with signal radiation, which could affect transmission distance.
6)The antenna should be kept away from other circuits to maintain radiation efficiency and avoid impacting the normal operation of other circuits.
7)Position the module as close to the edge of the circuit board as possible, away from other circuitry.
8) It is recommended to use a ferrite bead for isolation when connecting the module to the power supply.

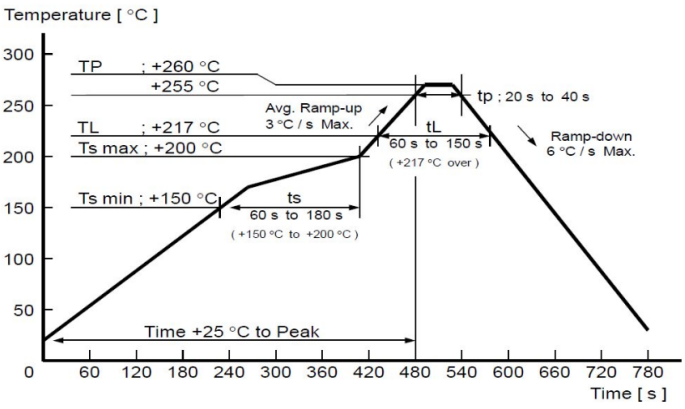




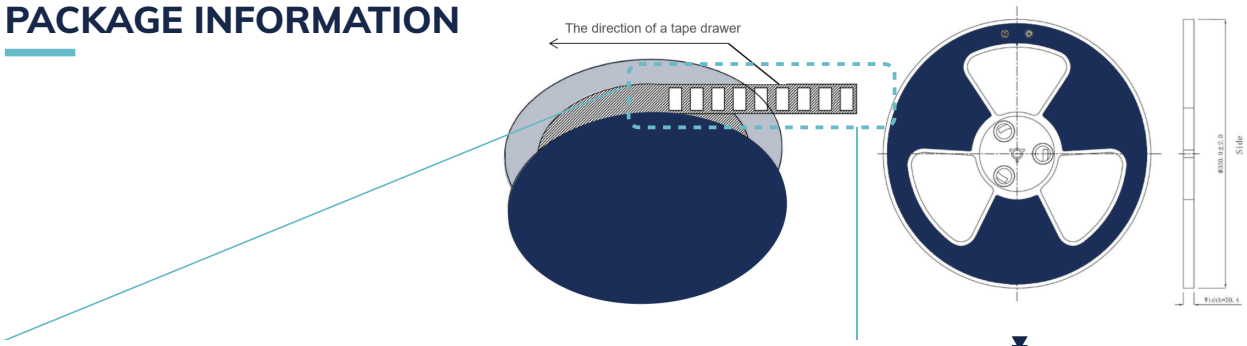
8 REFLOW AND SOLDERING

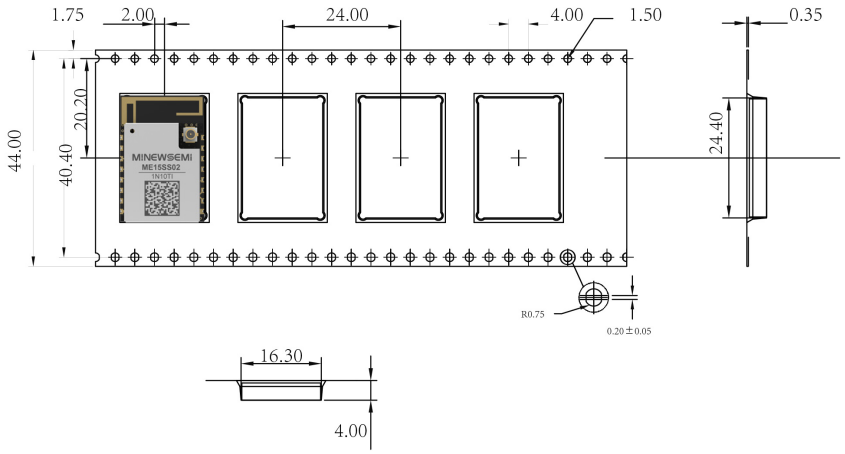
1) Perform SMT according to the reflow oven temperature profile provided below, with a maximum temperature of 260°C;
2) Follow IPC/JEDEC standards; Peak temperature: < 260°C; Number of reflows: ≤2 times; For SMT involving double-sided placement, it is recommended that the module side undergoes reflow soldering only once. For any special processes, please contact our company.

3) Suggesting to make 0.2mm thickness of module SMT for partial ladder steel mesh, then make the opening extend 0.8mm
4)After opening, if the entire package is not used at once, it should be stored in a vacuum to prevent long-term exposure to air, which can cause moisture absorption and pad oxidation. If there is a gap of 7 to 30 days before reuse, it is recommended to bake the tape at 65-70°C for 24 hours without unrolling it before returning to SMT.
5) ESD protection measures should be implemented before using SMT.



9 PACKAGE INFORMATION





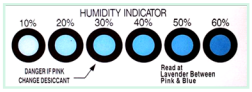
Inner carton(*5)
355*345*65mm，±5mm

Outer carton
370*358*350mm，±10mm

Remarks

General material list for FCL packaging:

Carrier tape packaging tray



Humidity Indicator
(1 pcs/bag)

Desiccant
(placed in a vacuum bag)

Vacuum bag

Inner carton(*5)
355*345*65mm，±5mm

Outer carton
370*358*350mm，±10mm

Other:

Moisture-proof label (attached to the vacuum bag)

Certification label (attached to the vacuum bag)

Outer box label

Default unit：mm Default tolerance：±0.1

Packing Detail	Specification	Net Weight	Gross Weight	Dimension
ME15SS02	640PCS	1152g	3165g	W=44mm，T=0.35mm

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

10 STORAGE CONDITIONS

- **Please use this product within 6 months after signing the receipt.**
  - This product should be stored without opening the package at an ambient temperature of 5~35°C and a humidity of 20~70%RH.
  - This product should be left for more than 6 months after receipt and should be confirmed before use.
  - The product must be stored in a non-corrosive gas (CI2, NH3, SO2, NOx, etc.).
  - To avoid damaging the packaging material, do not apply any excessive mechanical shocks, including but not limited to sharp objects adhering to the packaging material and product dropping.

- **This product is suitable for MSL2 (based on JEDEC standard J-STD-020).**
  - After opening the package, the product must be stored at ≤30°C/<60%RH. It is recommended to use the product within 3-6 months after opening the package.
  - When the color of the indicator in the package changes, the product should be baked before welding.

- **Baking is not required for one year if exposure is limited to <30°C and 60%RH. Refer to MSL2 for exposure criteria for moisture sensitivity level. If exposed to (≥168h@85°C/60%RH) conditions or stored for more than one year, recommended baking conditions.**
  1. 120 +5/-5°C, 8 hours, 1 time
  Products must be baked individually on heat-resistant trays because the materials (base tape, reel tape, and cover tape) are not heat-resistant, and the packaging material may be deformed at temperatures of 120℃;
  2、90℃ +8/-0℃，24hours，1times
  The base tape can be baked together with the product at this temperature. Please pay attention to the uniformity of heat.

11 HANDLING CONDITIONS

• Be careful in handling or transporting products because excessive stress or mechanical shock may break products.
• Handle with care if products may have cracks or damages on their terminals. If there is any such damage, the characteristics of products may change. Do not touch products with bare hands that may result in poor solder ability and destroy by static electrical charge.

12 QUALITY

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, OHSA18001, 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.

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14 RELATED DOCUMENTS

- MinewSemi_Product_Naming_Reference_Manual
  https://en.minewsemi.com/file/MinewSemi_Product_Naming_Reference_Manual_EN.pdf
- MinewSemi_Connectivity_Module_Catalogue
  https://en.minewsemi.com/file/MinewSemi_Connectivity_Module_Catalogue_EN.pdf

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