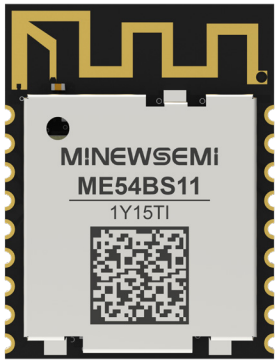
MINEWSEMI

Bluetooth LE Module

ME54BS11



Datasheet

V 1.0.0

Version Note

Version	Details	Contributor(s)	Date	Notes
1.0.0	First edit	Owen	2025.03.19	

Part Number

Model	Hardware Code
ME54BS11	1Y15TI

Click the icon to view and download the latest product documents electronically.
https://en.minewsemi.com/file/ME54BS11_Datasheet_K_EN.pdf

ME54BS11-nRF54L15

Cost-effective, Ultra-low Power Bluetooth Module Supports Bluetooth LE 6.0

ME54BS11 is a highly flexible, ultra-low power, cost-effective Bluetooth module based on nRF54L15. Its powerful Arm® Cortex®-M33 CPU, the core running speed of 128Mhz.Hardware with on-board antenna, integrated design highlights the nRF54 series of higher performance, and provide more GPIO development use, while ultra-low system power consumption and excellent RF performance and other powerful supporting resources for Bluetooth connectivity to provide the perfect solution.

FEATURES

- Bluetooth 6.0
- High cost Performance
- Ultra-low Power
- Multi-Protocol supports: Bluetooth LE 6.0 Channel Sounding, Bluetooth Mesh, Thread, Matter, and proprietary 2.4 GHz protocols

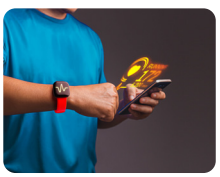
KEY PARAMETER

ME54BS11			
Chip Model	nRF54L15	**Antenna**	PCB
Module Size	15.8×12×2mm	**GPIO**	12
Flash	1.5MB	**RAM**	256 KB
Receiving Sensitivity	-96dBm	**Transmission Power**	-40~+7dBm
Current(TX)	0dBm-5mA	**Current(RX)**	3.2mA

APPLICATION

Smart Home

Computer Accessories



Virtual reality and Augmented reality

Game controllers and Remotes

Medical Devices

Industrial IoT

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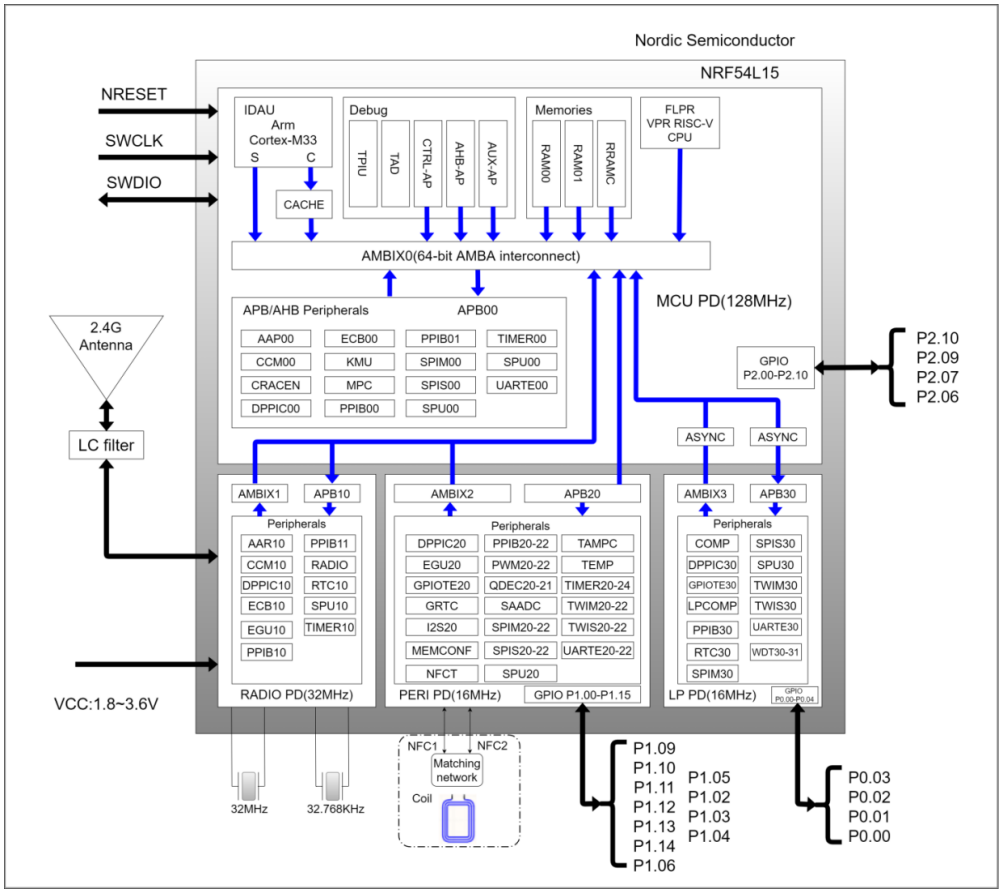
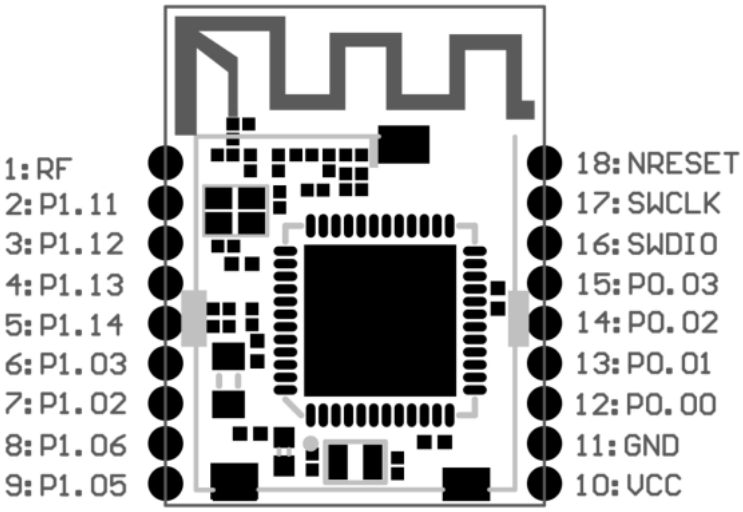
1 BLOCK DIAGRAM



2 ELECTRICAL SPECIFICATION

Parameter	Values	Notes
Working Voltage	1.7V-3.6V	To ensure RF work, supply voltage suggest not lower than 2.3V
Working Temperature	-40℃~+105℃	Operating temperature from -40°C to 105°C
Transmission Power	-40~+7dBm	Configurable
Current(RX)	3.2mA	RF receiving current under 1Mbps pattern
Current(TX)	5mA	RF transmission current under 0dBm pattern
Module Dimension	15.8x12x2mm	
Quantity of IO Port	12	

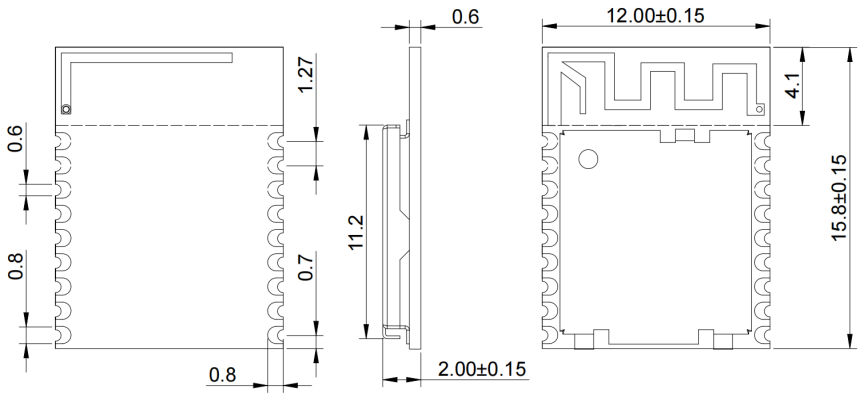
3 PIN DESCRIPTION



4 PIN DEFINITION

Pin Number	Symbol	Type	Definition
1	ANT	External Antenna	If using the module's built-in antenna, this pin should be left unconnected. If not using the module's built-in antenna, an external antenna can be connected through this pin. When connecting an external antenna, a resistor that connects to the antenna should be soldered horizontally to this pin.
2~9	P1.11-P1.14 P1.03 P1.02 P1.06 P1.05	GPIO	General-purpose IO
10	VCC	Power Supply	
11	GND	GND	
12-15	P0.05 to P0.3	GPIO	General-purpose IO
16	SWDIO	Programming Data	Used for firmware programming
17	SWCLK	Programming Clock	Used for firmware programming
18	NRESET	Reset	Low level reset, high level work

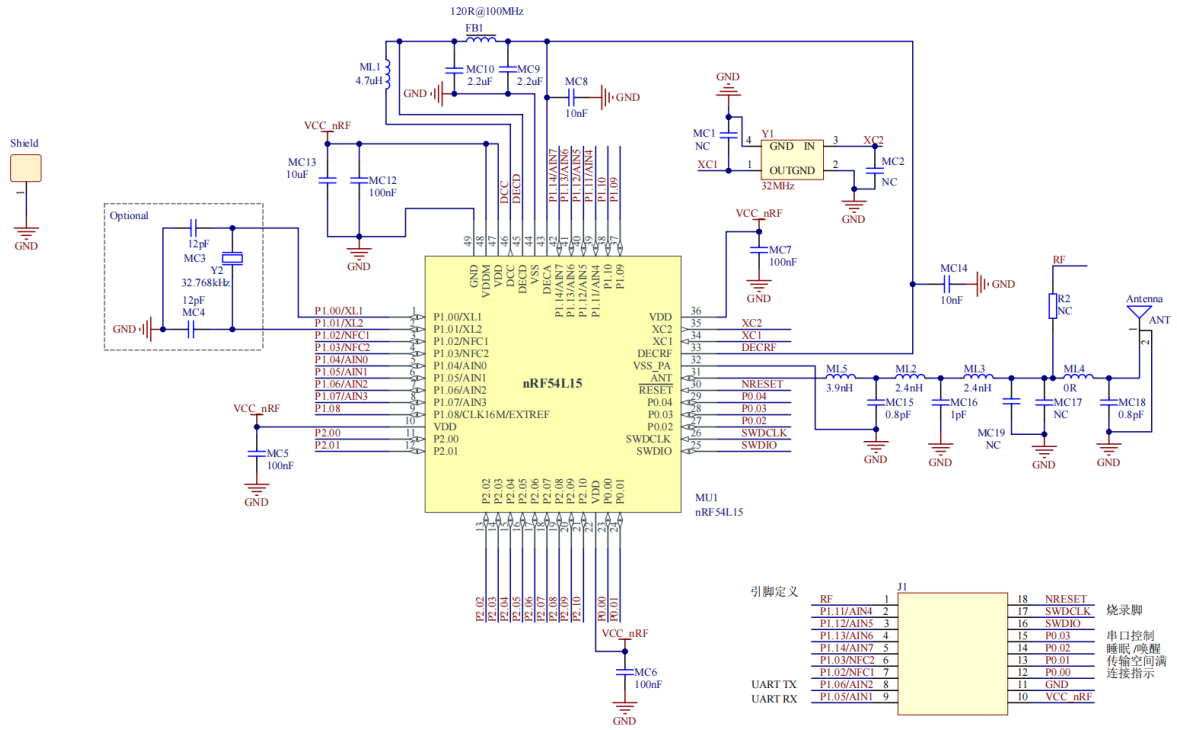
5 MECHANICAL DRAWING



Default unit: mm Default tolerance: ±0.15

Note: The recommended pad size is 1.4*0.8mm, with the pad extending outward by 0.5mm.

6 ELECTRICAL SCHEMATIC



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

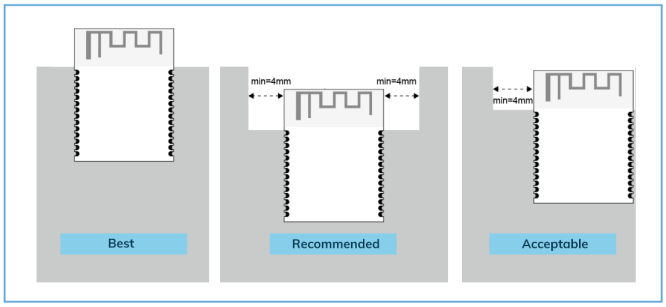
7 PCB LAYOUT

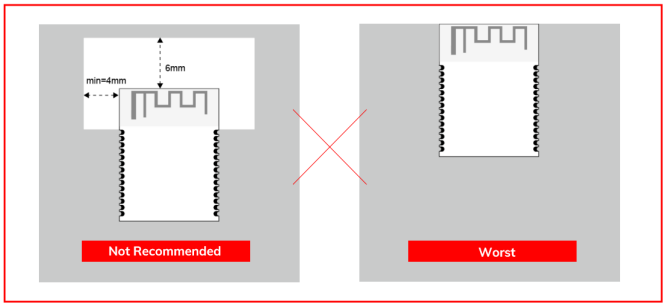
There should be no GND plane or metal cross wiring in the module antenna area, and no components should be placed nearby. It is best to make a hollow or clear area, or place it on the edge of the PCB board. The reference example is as follows:

> 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.

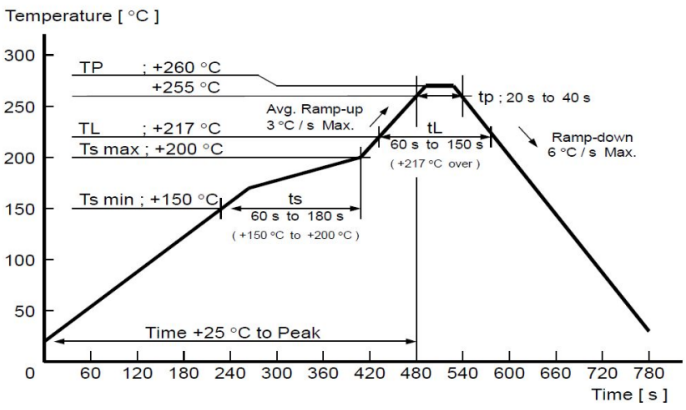




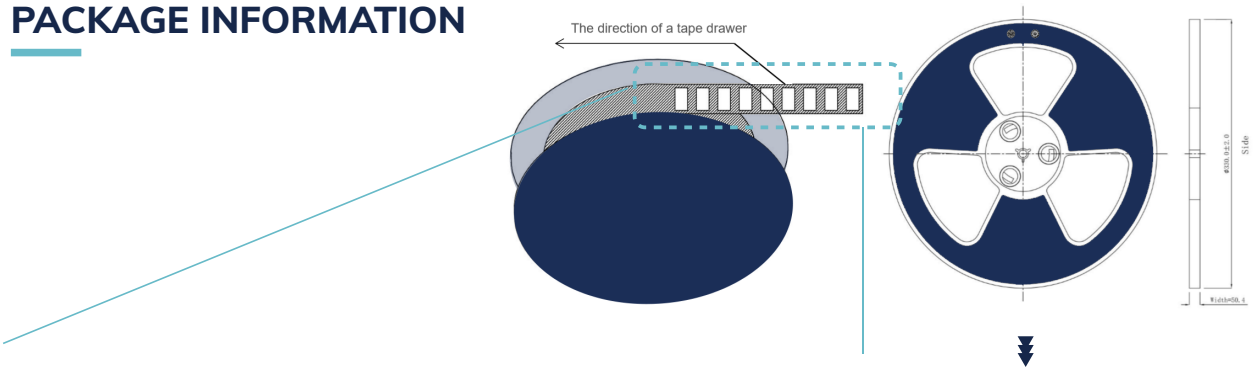
8 REFLOW AND SOLDERING

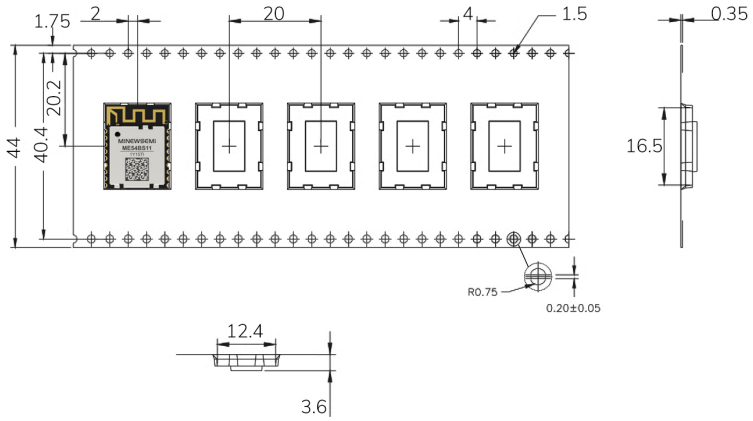
1) Perform SMT according to the reflow oven temperature profile provided below, with a maximum temperature of 260°C;
2) Follow IPC/JEDEC standards; Peak temperature: < 260°C; Number of reflows: ≤2 times; For SMT involving double-sided placement, it is recommended that the module side undergoes reflow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

3) Module SMT recommended stencil thickness 0.13-0.15mm, pin length outreach 1-1.3mm;
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





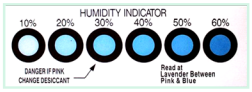
Inner carton(*5)
355*345*65mm，±5mm

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
ME54BS11	850PCS	595g	1470g	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.

13 COPYRIGHT STATEMENT

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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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MINEWSEMI
Innovative IoT Module Expert

SHENZHEN MINEWSEMI CO., LTD.

0086-755-2801 0353
https://minewsemi.com
minewsemi@minew.com
https://store.minewsemi.com
Gangzhilong Technology Park, Qinglong Road, Longhua District, Shenzhen