

**MINESMI**

# Bluetooth LE Module

## ME54BS03



### Datasheet

v 1.0.0

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## Version Note

Version	Details	Contributor(s)	Date	Notes
1.0.0	First edit	Owen	2024.10.18	

## Part Number

Model	Hardware Code
ME54BS03	3Y15TI

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[https://en.minesemi.com/file/ME54BS03-nRF54L15\\_Datasheet\\_K\\_EN.pdf](https://en.minesemi.com/file/ME54BS03-nRF54L15_Datasheet_K_EN.pdf)



# ME54BS03-nRF54L15

## Cost-effective, Ultra-low Power Bluetooth Module with BLE 5.4

ME54BS03 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, in addition, it also comes with 1.5MB NVM space, 256 KB RAM. It is also designed for PSA Level 3 certification and has high security protection. The hardware is equipped with an onboard antenna, and the integrated design highlights the higher performance of the nRF54 series and provides more GPIO development and use. At the same time, the ultra-low system power consumption and excellent RF performance as well as other powerful supporting resources can provide a perfect solution for Bluetooth connection.

## FEATURES



Bluetooth 5.4



High cost performance



Ultra-low Power



Hardware support for Bluetooth mesh, Thread, Matter and other protocol development

## KEY PARAMETER

### ME54BS03

<b>Chip Model</b>	nRF54L15	<b>Antenna</b>	IPEX
<b>Module Size</b>	23.2×17.4×2mm	<b>GPIO</b>	19
<b>Flash</b>	1.5MB	<b>RAM</b>	256KB
<b>Receiving Sensitivity</b>	-96dBm	<b>Transmission Power</b>	-8 ~ +8dBm
<b>Current(TX)</b>	0dBm-5mA	<b>Current(RX)</b>	3.2mA

## APPLICATION



Smart Home



Computer Accessories



Virtual reality and Augmented reality



Game controllers and Remotes



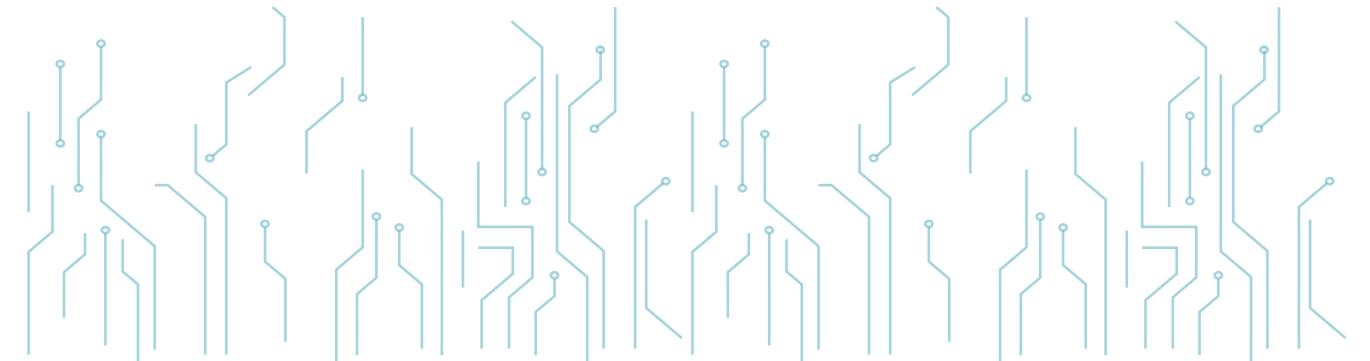
Medical Devices



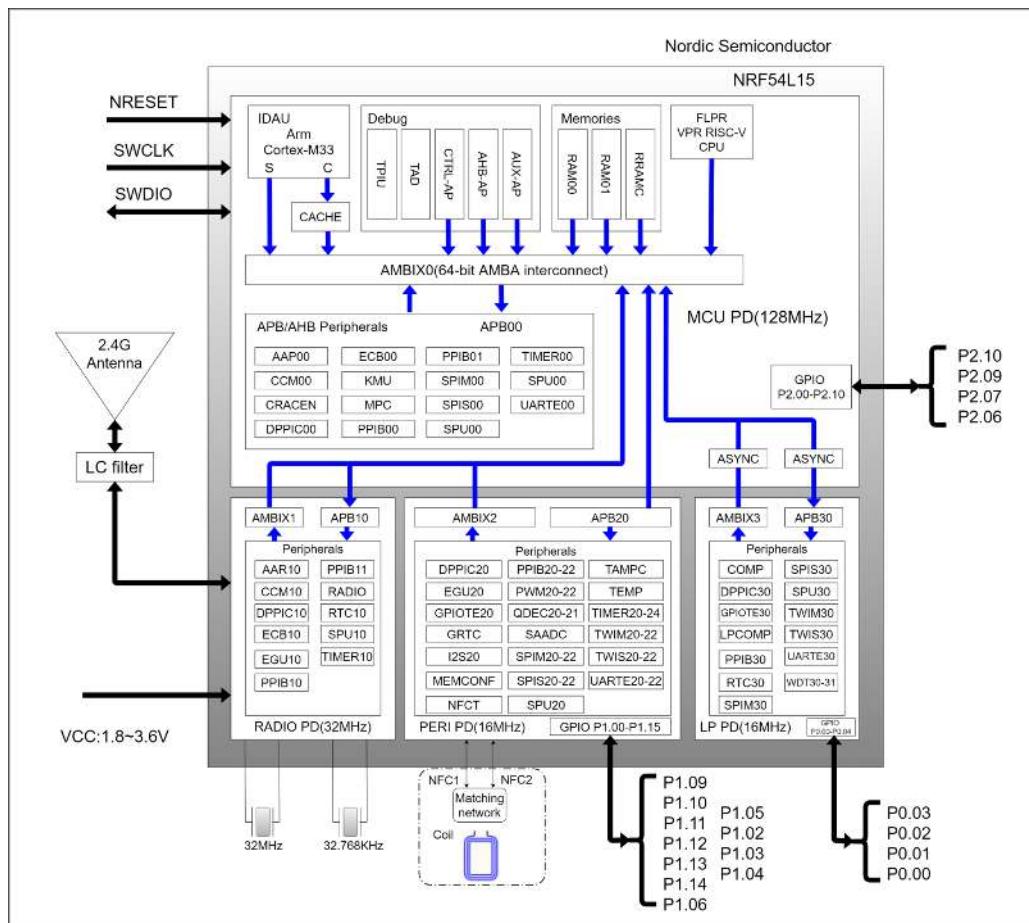
Industrial IoT

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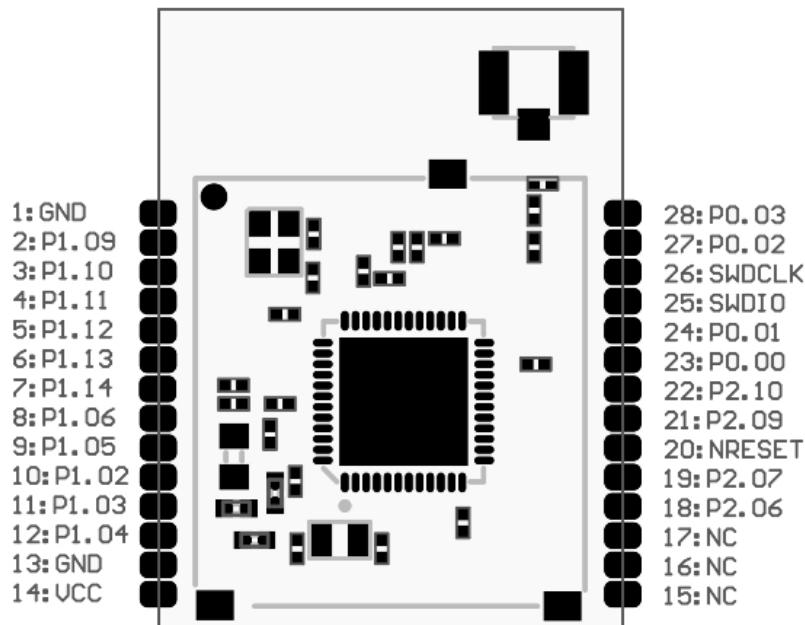
# 1 BLOCK DIAGRAM



# 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°C~+105°C	Operating temperature from -40°C to 105°C
Transmission Power	-8 ~ +8dBm	Configurable
Current(RX)	3.2mA	RF receiving current under 1Mbps pattern
Current(TX)	5mA	RF transmission current under 0dB pattern
Module Dimension	23.2x17.4x2mm	
Quantity of IO Port	19	

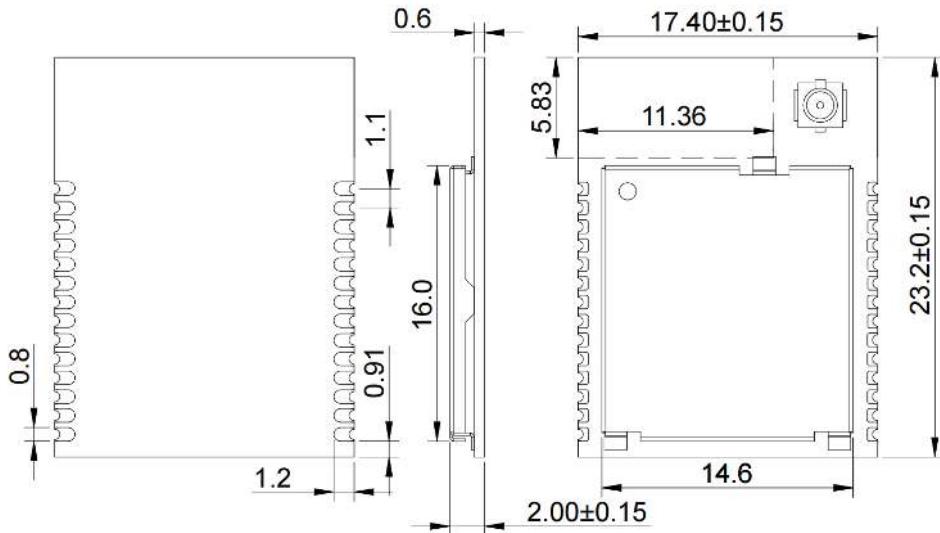
## 3 PIN DESCRIPTION



## 4 PIN DEFINITION

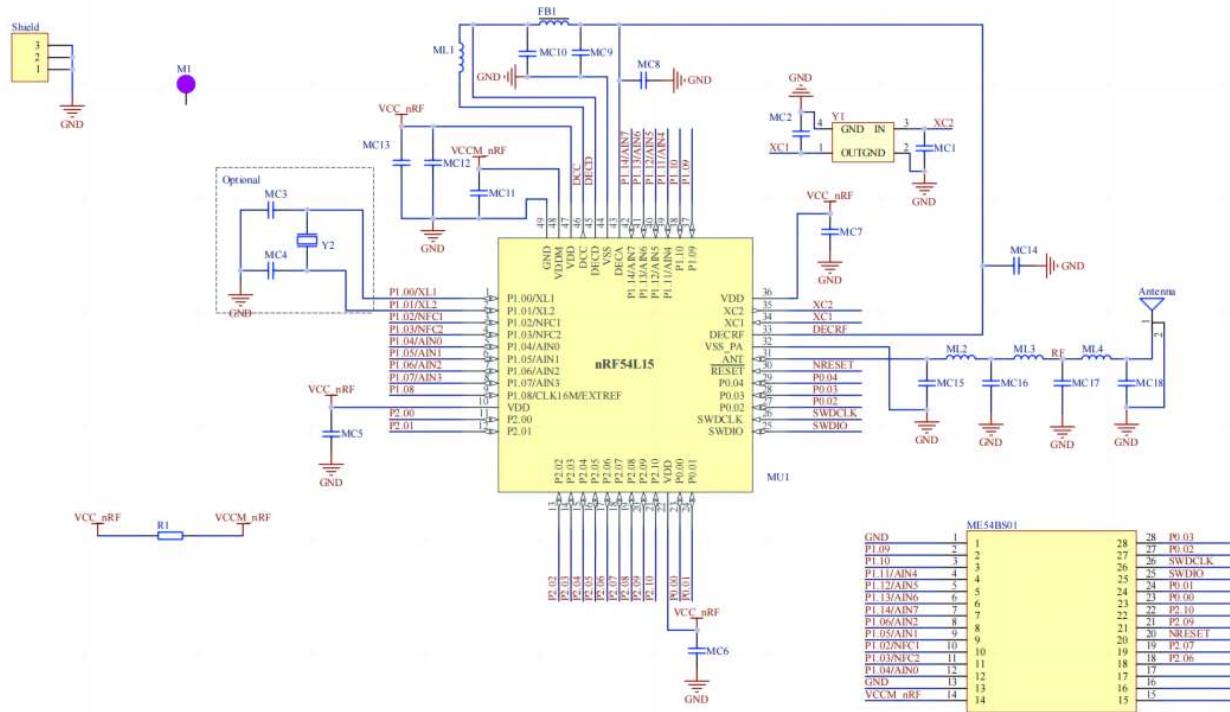
Pin Number	Symbol	Type	Definition
1/13	GND	GND	GND
2-12	P1.02-P1.06/ P1.09-P1.14	I/O	General IO Port
14	VCC	VCC	Power supply, default 1.8V-3.6V
15-17	NC	NC	Empty pins
18-19	P2.06/P2.07	I/O	General IO Port
20	NRESET	Reset pin	Reset
21-24	P2.03-P2.10/ P0.00-P0.01	I/O	General IO Port
25/26	SWDIO/SWDCLK	Burn Pins	Programming pin, when programming, just connect the power supply pin, ground, and these two pins
27-28	P0.02-P0.03	I/O	General IO Port

## 5 MECHANICAL DRAWING



⚠ Default unit: mm Default tolerance: ±0.15

## 6 ELECTRICAL SCHEMATIC



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

## 7 PCB LAYOUT

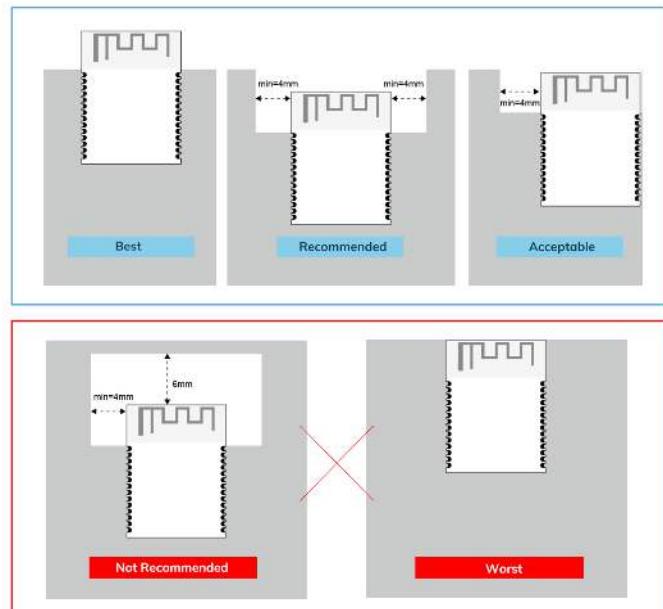
There should be no GND plane or metal cross wiring in the module antenna area, and components should not be placed nearby. It is best to make a hollow or clear area, or place it on the edge of the PCB board.



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.

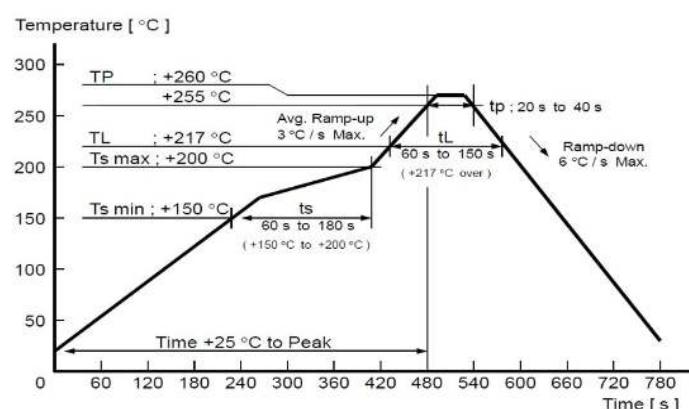
### Layout Notes:

- 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.

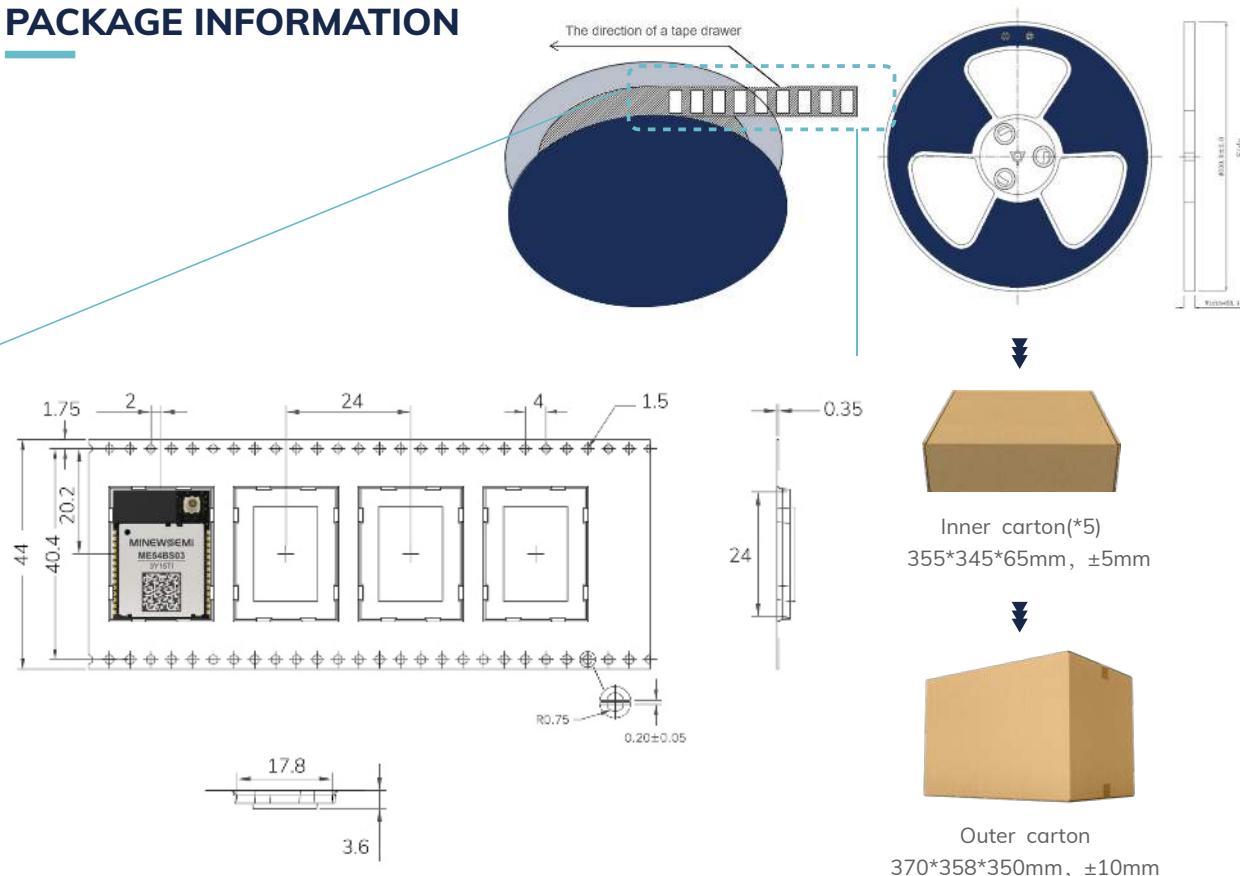


## 8 REFLOW AND SOLDERING

- 1) Do SMT according to above reflow oven temperature deal curve. Max. Temperature is 260 °C;
- 2) 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.
- 3) Suggesting to make 0.2mm thickness of module SMT for partial ladder steel mesh, then make the opening extend 0.8mm
- 4) 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.
- 5) Before using SMT, please adopt ESD protection measure.



## 9 PACKAGE INFORMATION

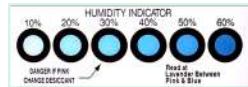


### Remarks

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
ME54BS03	650PCS	-	-	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 (Cl<sub>2</sub>, NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>x</sub>, 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  $\leq 30^{\circ}\text{C}/<60\%\text{RH}$ . 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  $<30^{\circ}\text{C}$  and 60%RH. Refer to MSL2 for exposure criteria for moisture sensitivity level. If exposed to ( $\geq 168\text{h}@85^{\circ}\text{C}/60\%\text{RH}$ ) conditions or stored for more than one year, recommended baking conditions.
  1.  $120 +5/-5^{\circ}\text{C}$ , 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  $120^{\circ}\text{C}$ ;
  2.  $90^{\circ}\text{C} +8/-0^{\circ}\text{C}$ , 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\_V1.0  
[https://en.minewsemi.com/file/Minewsemi\\_Product\\_Naming\\_Reference\\_Manual\\_EN.pdf](https://en.minewsemi.com/file/Minewsemi_Product_Naming_Reference_Manual_EN.pdf)
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