

Bluetooth LE Module

ME54BS03



Datasheet

V 1.0.0



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.minewsemi.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			
Chip Model	nRF54L15	Antenna	IPEX
Module Size	23.2×17.4×2mm	GPIO	19
Flash	1.5MB	RAM	256KB
Receiving Sensitivity	-96dBm	Transmission Power	-40~+8dBm
Current(TX)	0dBm-5mA	Current(RX)	3.2mA

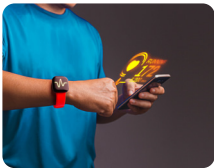
APPLICATION



Smart
Home



Computer
Accessories



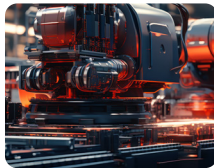
Virtual reality and
Augmented reality



Game controllers
and Remotes



Medical Devices

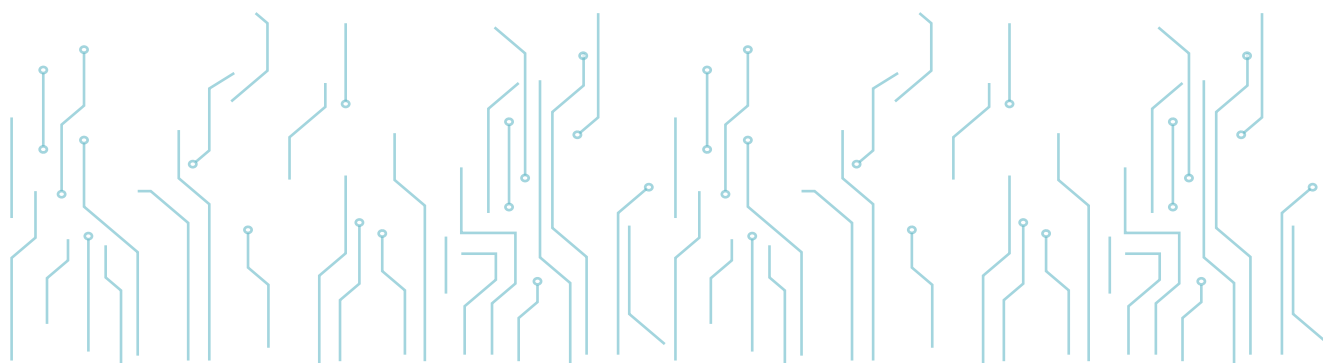


Industrial IoT

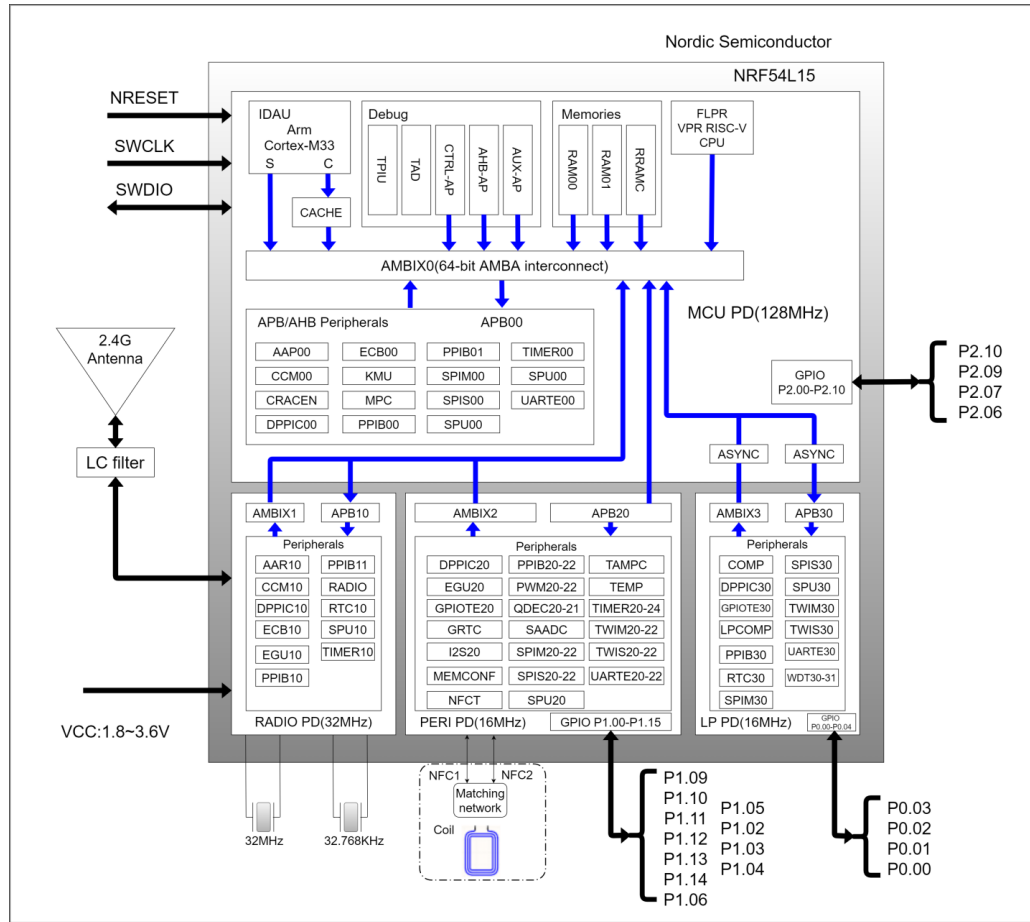


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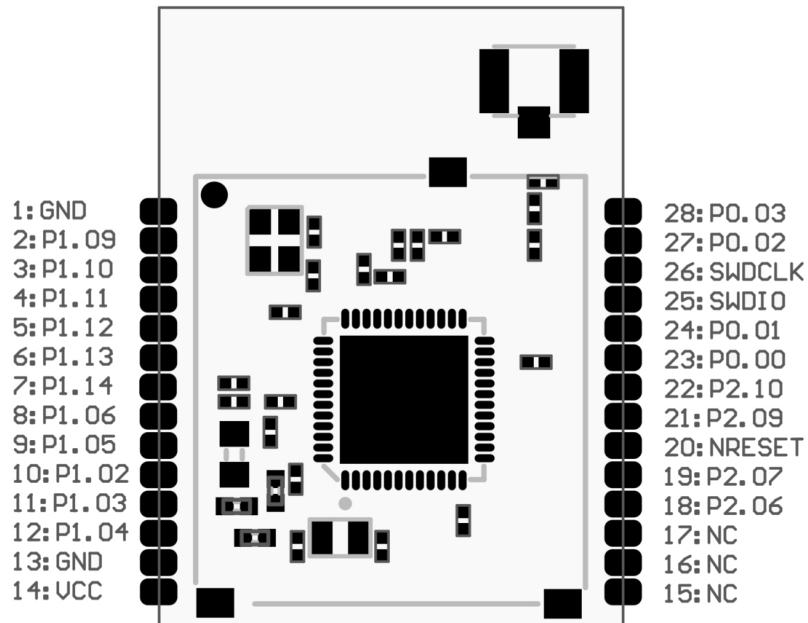
1 BLOCK DIAGRAM



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

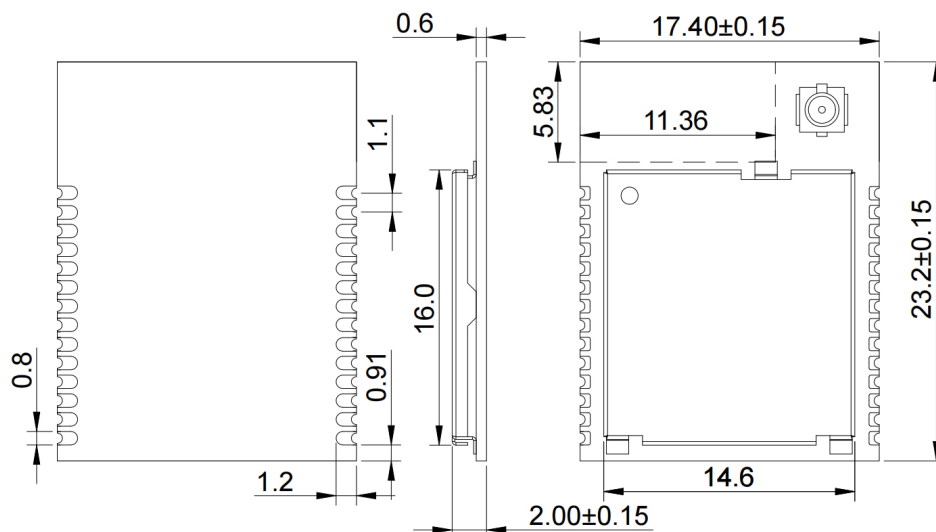
3 PIN DESCRIPTION



4 PIN DEFINITION

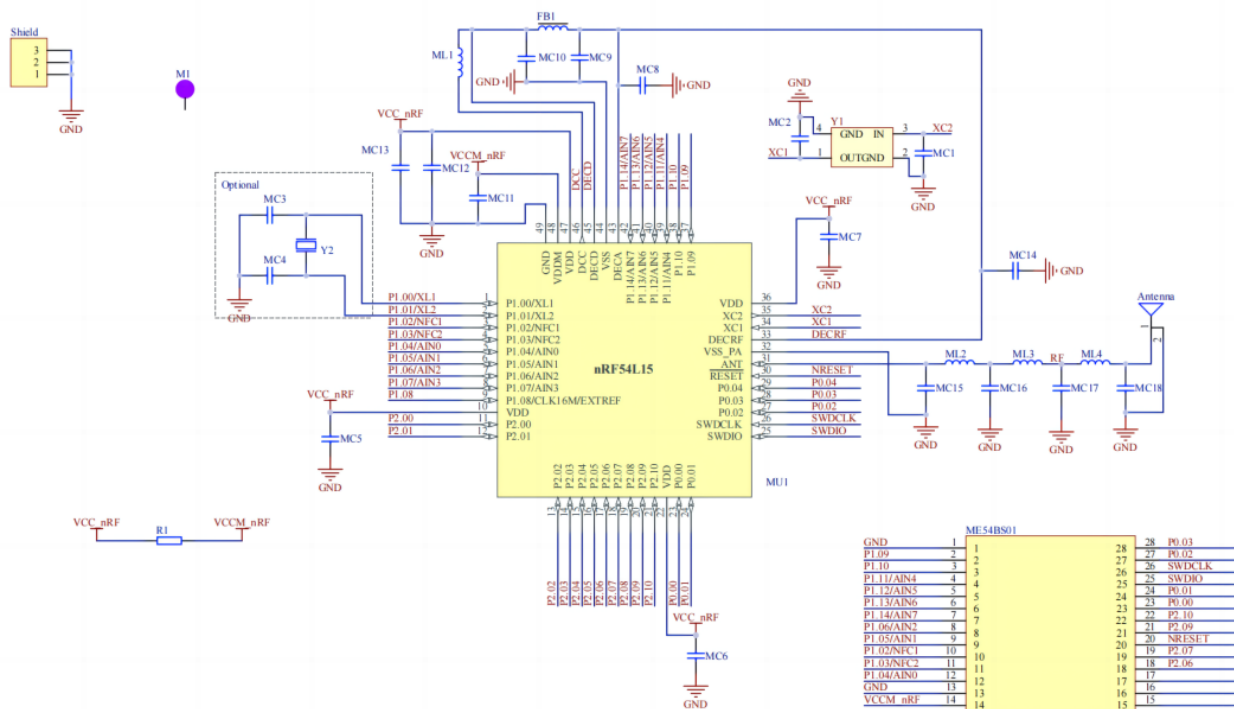
Pin Number	Symbol	Type	Definition
1/13	GND	GND	GND
2-12	P1.02-P1.06/ P1.09-P1.14	I/O	General IO Port
14	VCC	VCC	Power supply, default 1.8V-3.6V
15-17	NC	NC	Empty pins
18-19	P2.06/P2.07	I/O	General IO Port
20	NRESET	Reset pin	Reset
21-24	P2.03-P2.10/ P0.00-P0.01	I/O	General IO Port
25/26	SWDIO/SWDCLK	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

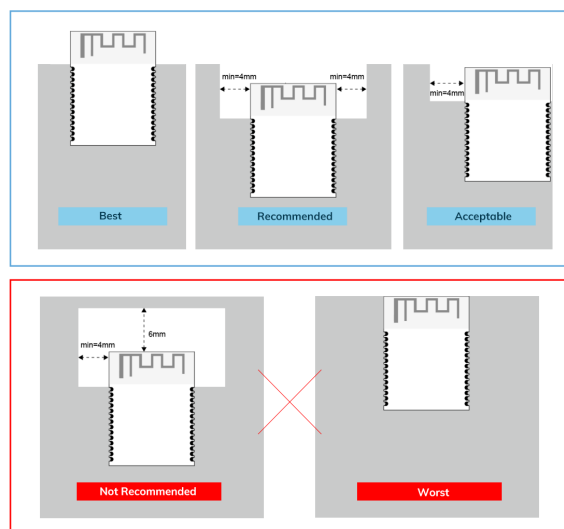
There should be no GND plane or metal cross wiring in the module antenna area, and no components should be placed nearby. It is best to make a hollow or clear area, or place it on the edge of the PCB board. The reference example is as follows:



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

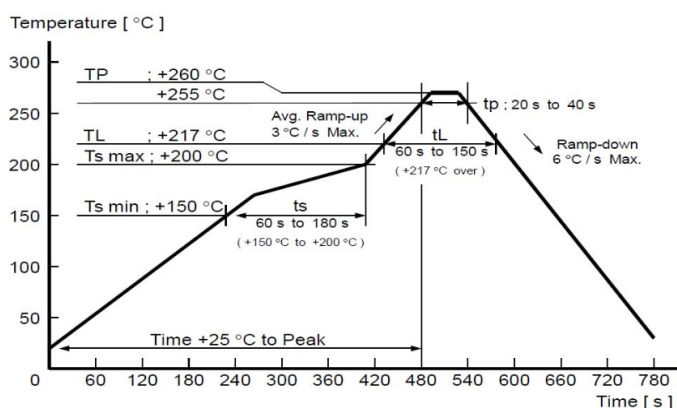
Layout Notes:

- 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.

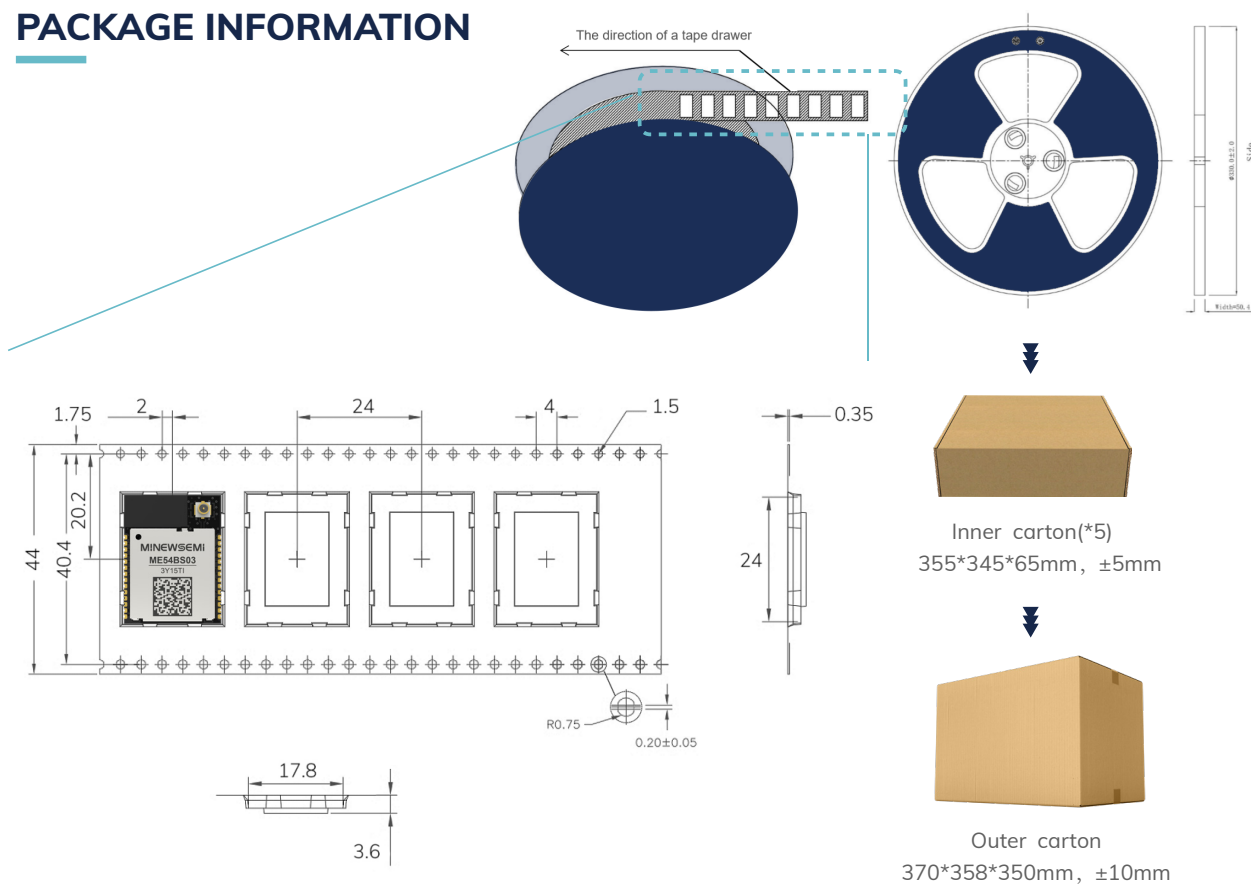


8 REFLOW AND SOLDERING

- 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 steel mesh thickness 0.13-0.15mm;
- 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.

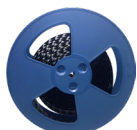


9 PACKAGE INFORMATION

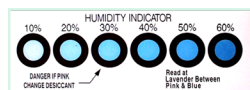


Remarks

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 (Cl₂, NH₃, SO₂, NO_x, 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 timeProducts 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 °C;
 2. 90 °C ±8/-0 °C, 24hours, 1timesThe 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, OHSAS18001, 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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