MINEWSEMI

LoRaWAN Module
ME25LS01

Datasheet

V 1.0.0

Version Note

Version	Details	Contributor(s)	Date	Notes
1.0.0	First edit	Vincle, Leo	2024.06.06	

Part Number

Model	Hardware Code
ME25LS01	4Y10TD-X

Note: The meaning of "X"	
	0 AS923, Support 923MHz frequency 1 AU915, Support 915-928MHz frequency 2 CN470, Support 470-510MHz frequency 3 CN779, Support 779-787MHz frequency 4 EU433, Support 433MHz frequency 5 EU868, Support 863-870MHz frequency 6 IN865, Support 865-867MHz frequency 7 KR920, Support 920-923MHz frequency 8 RU864, Support 864-870MHz frequency 9 US915, Support 902-928MHz frequency

The marking on the product's shielding cover is subject to change based on certification updates.
The actual marking on the shielding cover at the time of shipment shall prevail.

Please be aware that changes in the marking do not affect product performance or usage; therefore, no separate notification will be issued regarding such changes.

For customization requests, please contact MinewSemi's sales team for confirmation.

Click the icon to view and download the latest product documents electronically.
https://en.minewsemi.com/file/ME25LS01_LR1110_Datasheet_K_EN.pdf

ME25LS01-LR1110+nRF52840

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

The ME25LS01 is a highly-performance, long-range,ultra-low power, Small size, support WiFi-scan/GNSS(GPS/BDS)/BLE5.3/LoRaWAN and other multi-protocols, and has a large storage capacity of 256KB RAM and 1MB Flash. The ME25LS01 has better reception sensitivity, with BLE as low as -96dBm and LoRa as low as -125.6dBm, and , the maximum power of BLE is 6dBm and the maximum power of LoRa is 22dBm, which is available for longer transmission distances. the power supply voltage of the module is 3.3V, and there are abundant GPIOs. and has a completely open-source development platform, which supports customers' secondary development and customisation 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
- Open-source development platform

KEY PARAMETER

ME25LS01			
Chip Model	LR1110+nRF52840	**Antenna**	ANT pin
Module Size	25.5x20x2.5mm	**GPIO**	44
Flash	1MB	**RAM**	256KB
Receiving Sensitivity	BLE:-96dBm LoRa:-125.6dBm	**Transmission Power**	BLE:-40-+8dBm LoRa: 22dBm
Current(TX)	Max- 118mA	**Current(RX)**	Max-10.7mA

APPLICATION

Agricultural automation

Asset tracking

Inventory management

Livestock tracking

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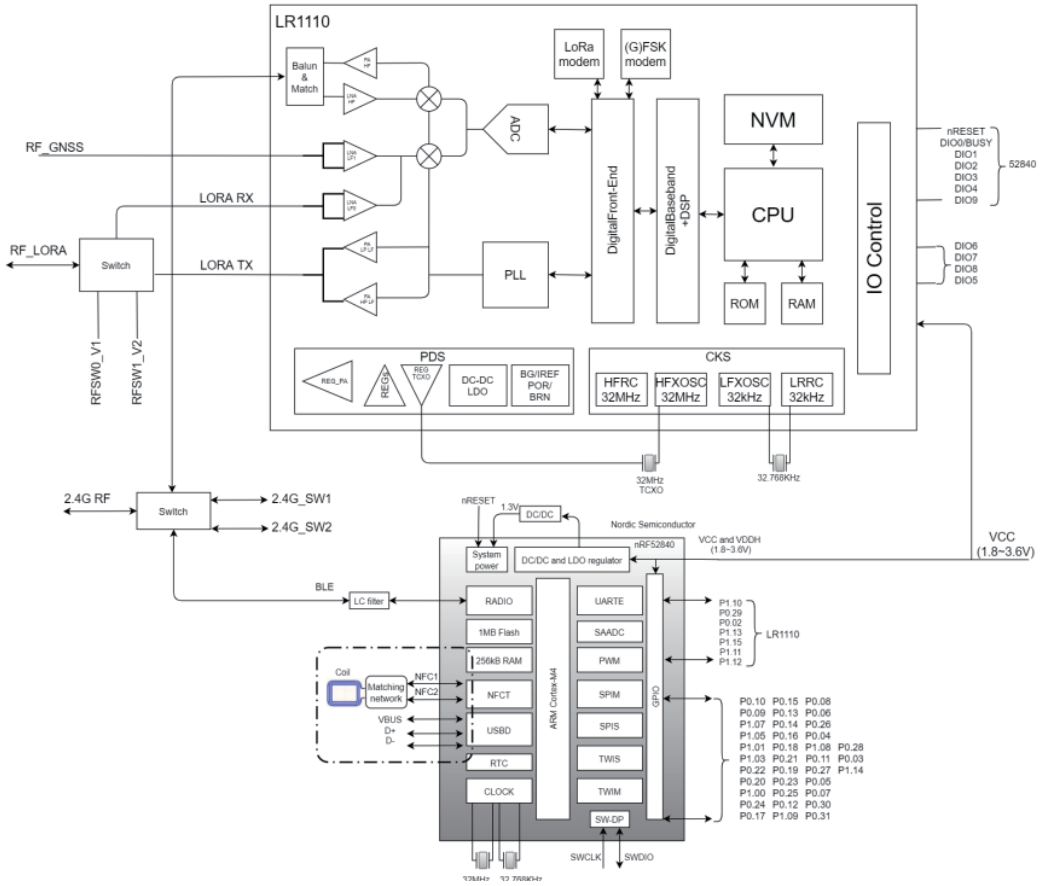
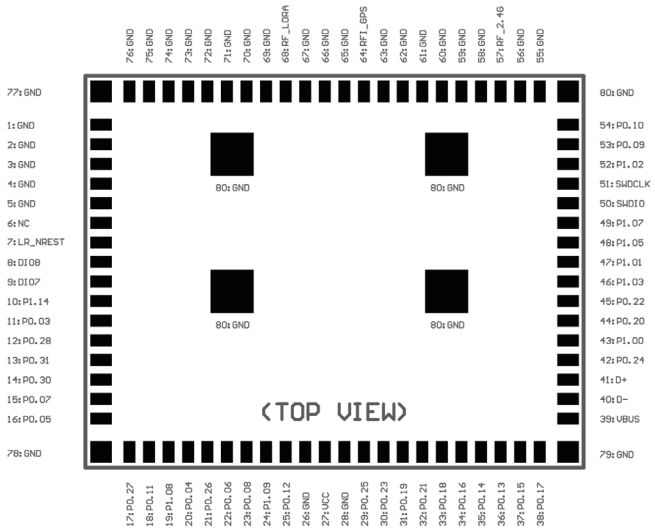
1 BLOCK DIAGRAM



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℃~+125℃
Opearting 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*2.5mm	
Quantity of IO Port	44	I2C、UART、USB、SPI etc.

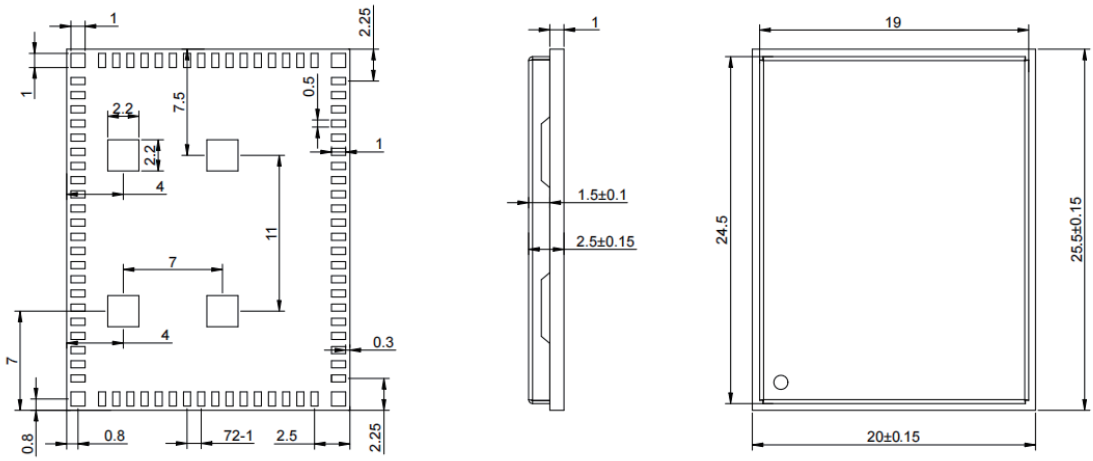
3 PIN DESCRIPTION



4 PIN DEFINITION

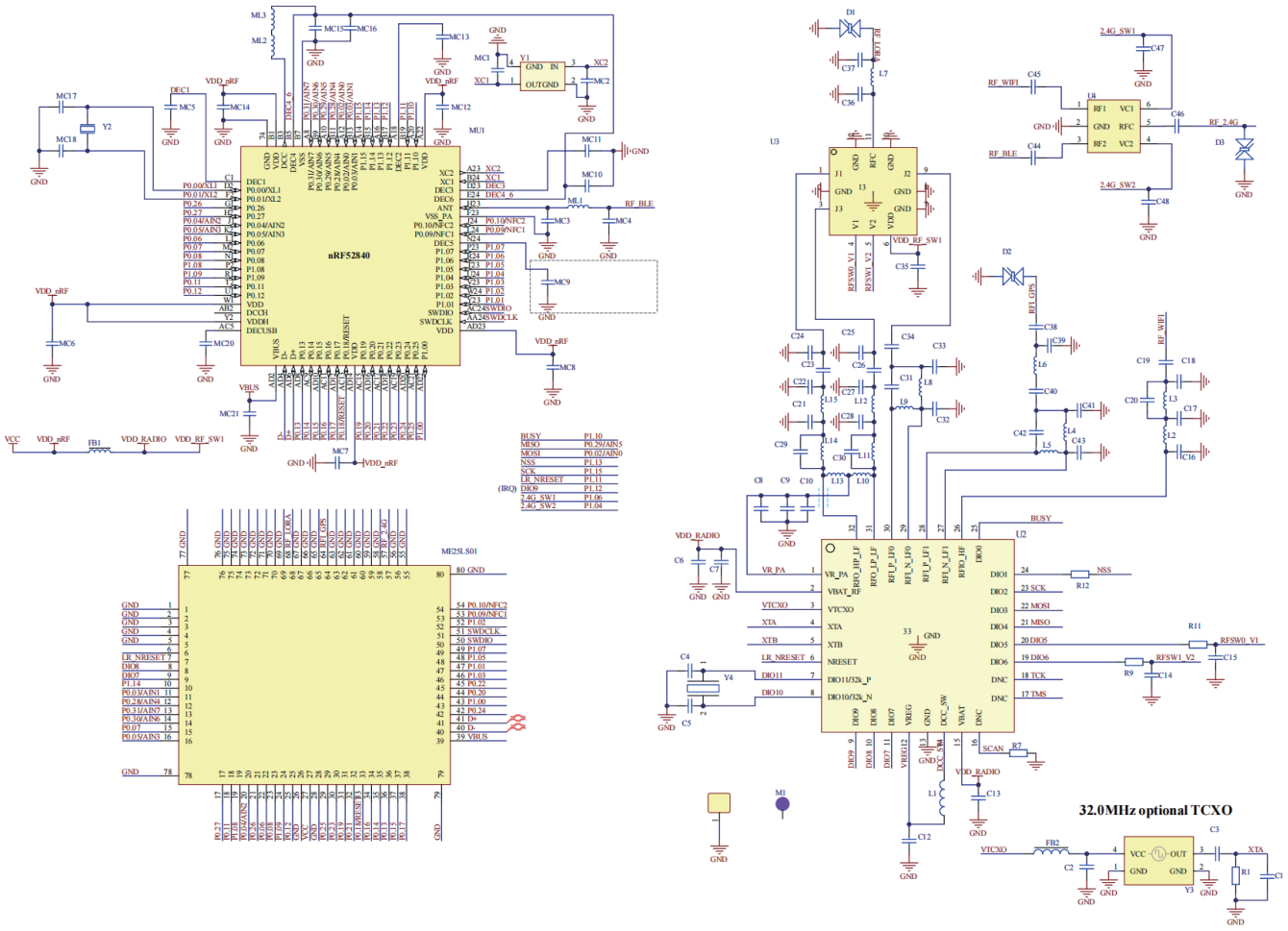
Symbol	Type	Definition
VCC	Positive power supply	Power supply, 1.7V-3.6V, with this pin
VBUS	Power supply	Power supply conversion access required for USB port
GND	Negative power supply	Grounded
SWCLK/SWDIO	I/O, Debug pin	I/O pin multiplexing, debug pin. During debugging, only connect this pin with the power and ground pins:
P0.03-P0.31	GPIO	General IO port
P1.00-P1.03	GPIO	General IO port
P1.07-P1.09- P1.05/P1.14	GPIO	General IO port
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: ±0.15

6 ELECTRICAL SCHEMATIC



7 PCB LAYOUT

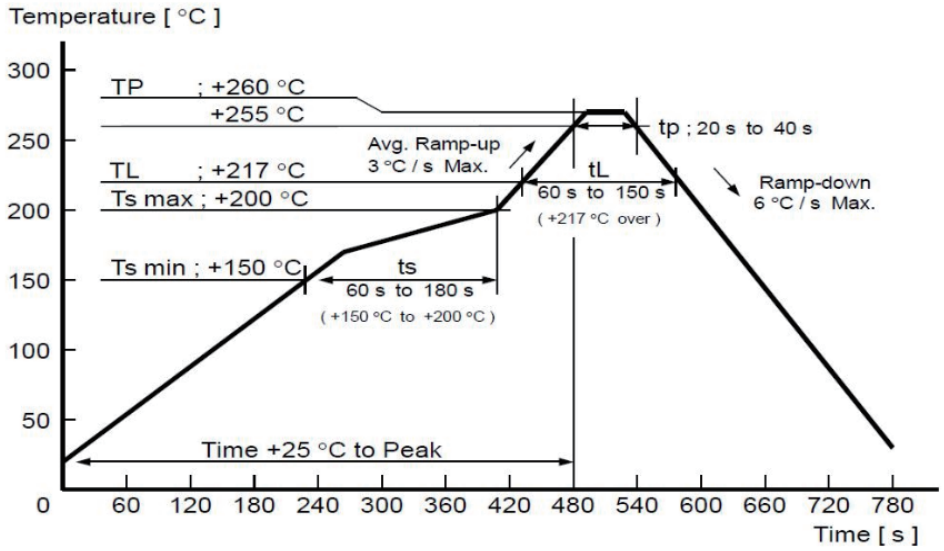
There should be no GND plane or metal cross wiring in the module antenna area, and no components should be placed nearby. It is best to make a hollow or clear area, or place it on the edge of the PCB board. The reference example is as follows:

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.

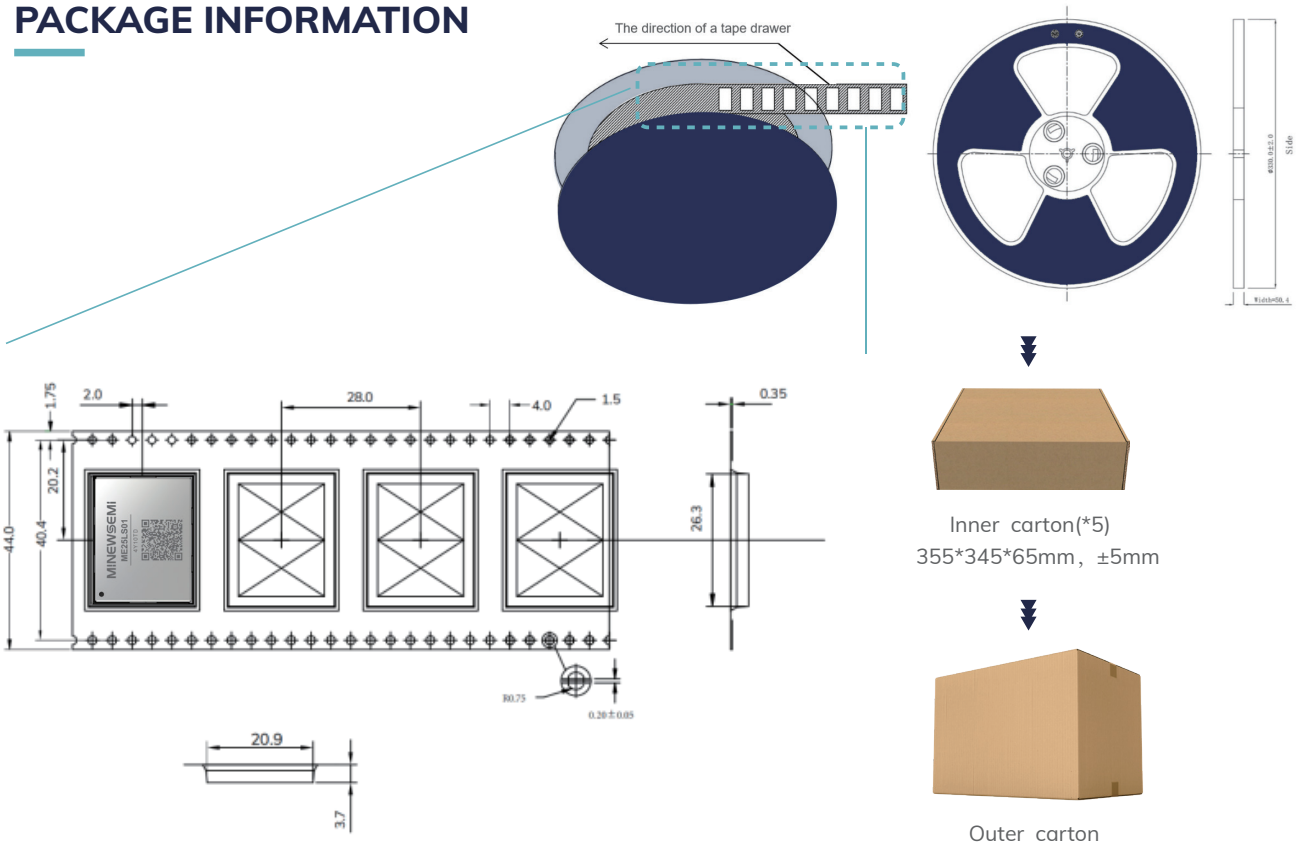
8 REFLOW AND SOLDERING

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 Steel mesh thickness 0.1-0.12mm of module SMT, then pin opening 1:0.9, no expansion.
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

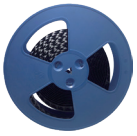


Inner carton(*5)
355*345*65mm，±5mm

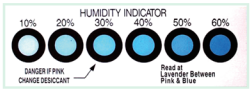
Outer carton
370*358*350mm，±10mm

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
ME25LS01	620PCS	1612g	2128.8g	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

- LR1110_Chip_Datasheet
  https://en.minewsemi.com/file/LR1110_Chip_Datasheet_EN.pdf
- nRF52840_Chip_Datasheet
  https://en.minewsemi.com/file/nRF52840_Chip_Datasheet_EN.pdf
- MinewSemi_Product_Naming_Reference_Manual
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