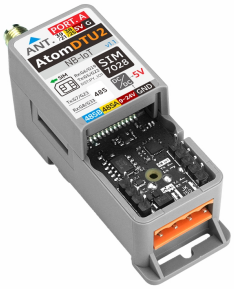
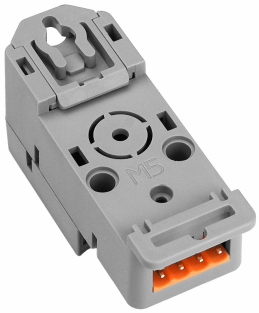
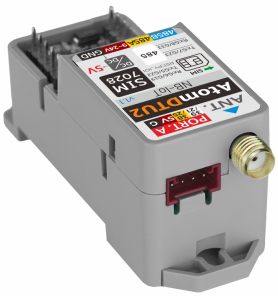
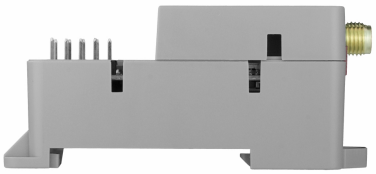
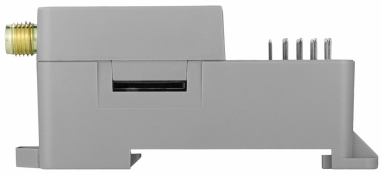
Atom DTU NBIoT2 v1.1

SKU:A106-V21








Description

Atom DTU NBIoT2 v1.1 is a programmable NB-IoT wireless Data Transmission Unit (DTU) designed for global Cat-NB frequency bands. Upgraded from the previous generation, it mainly adds an IO expansion chip to enable control of the communication module power enable and software reset, which helps reduce power consumption and ensures that the SIM module can be reset without power cycling when abnormal conditions occur. At the same time, an ADC monitoring circuit has been added, supporting real-time acquisition of the input power voltage from the HT3.96-4P interface to enable power status monitoring. This unit integrates the SIM7028 communication module and uses UART communication (controlled via AT command set). It features an SMA external antenna interface, providing good communication quality and signal stability. The SIM7028 module supports multiple Cat-NB frequency bands and can be used worldwide. Compared with conventional DTUs that only support data transparent transmission, the Atom DTU series adopts a more open architecture design. Multiple interfaces (RS485, I2C / custom Grove interface) are reserved for user expansion, facilitating rapid connection of sensors and actuators. The built-in DIN rail mounting structure allows installation in various industrial control environments, making it suitable for low-latency, low-throughput scenarios such as remote control, asset tracking, remote monitoring, telemedicine, and shared bicycles.

Features

- Global version / multi-band support, suitable for worldwide use
- SIM7028 module, AT command control
- Micro-SIM IoT card
- IO expansion chip for communication module power enable and software reset control
- ADC monitoring circuit supporting power status monitoring
- External SMA antenna interface
- Reserved RS485, I2C / custom Grove interfaces
- Data rate (kbps): 127 (DL) / 159 (UL)
- Supports multiple network protocols such as MQTT and HTTP
- Multiple power supply methods

Includes

- 1 x Atom DTU NBIoT2 v1.1
- 1 x 850 ~ 1900 MHz SMA rubber antenna
- 1 x Hex Key L-Shape 1.5mm (For M2 Screw)
- 1 x M2 * 16mm cap head machine screw

- 1 x HT3.96-4P Terminal
- 1 x I/O Sticker

Applications

- Asset tracking
- Remote monitoring / control
- Shared bicycles

Specifications

Specification	Parameter
Communication Module	SIM7028
Supported Cat-NB Band	B1/B2/B3/B4/B5/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B66/B70/B85
Network Protocol	TCP/UDP/HTTP/TLS/DTLS/DNS/NTP/PING/LWM2M/COAP/MQTT/MQTTS/SSL
Carrier	Deutsche Telekom / Vodafone / Telefonica / China Telecom / China Mobile / China Unicom
Communication Method	UART 115200bps @ 8N
IO Expansion Chip	M5IOE1
Antenna Specification	Size 108 x 10mm, connector type SMA (male thread, female pin), operating band 850 ~ 1900 MHz, gain 2.0 ± 0.5, VSWR ≤ 3.0
Power Supply	RS485 port (HT3.96R-4P interface): 9 ~ 24V USB Type-C: 5V
Power Consumption	SIM module powered off: 24V@9mA (RS485 power); 5V@2.61mA (USB power) Standby: 5V@8.82mA Working (continuous TX/RX): 5V@43.91mA
Grove Load Capacity	DC 5V@1.3A (RS485 power supply)
Operating Temperature	0°C ~ 40°C
Installation Method	DIN rail mounting / mounting holes
Product Size	64.3 x 24.0 x 28.7mm
Product Weight	30.0g
Package Size	170.0 x 120.0 x 27.0mm
Gross Weight	51.2g

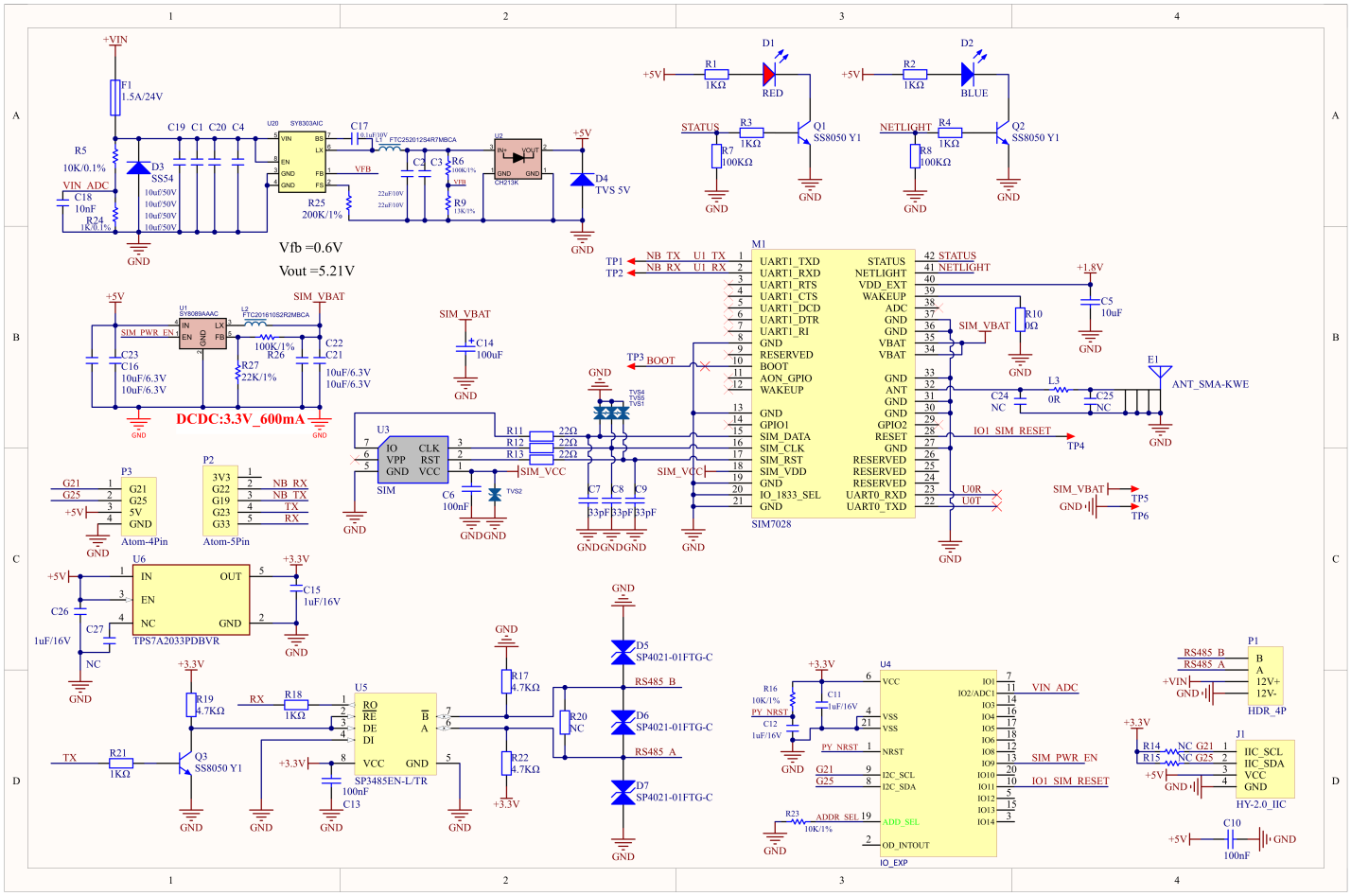
RS485 Communication Test

- Test conditions: 120Ω termination resistor added to A/B

Communication Distance	Data Rate
100 m	Maximum data rate 512Kbps, normal TX/RX, packet loss 0%, error rate 0%

Schematics

- Atom DTU NBIoT2 v1.1 Schematics PDF

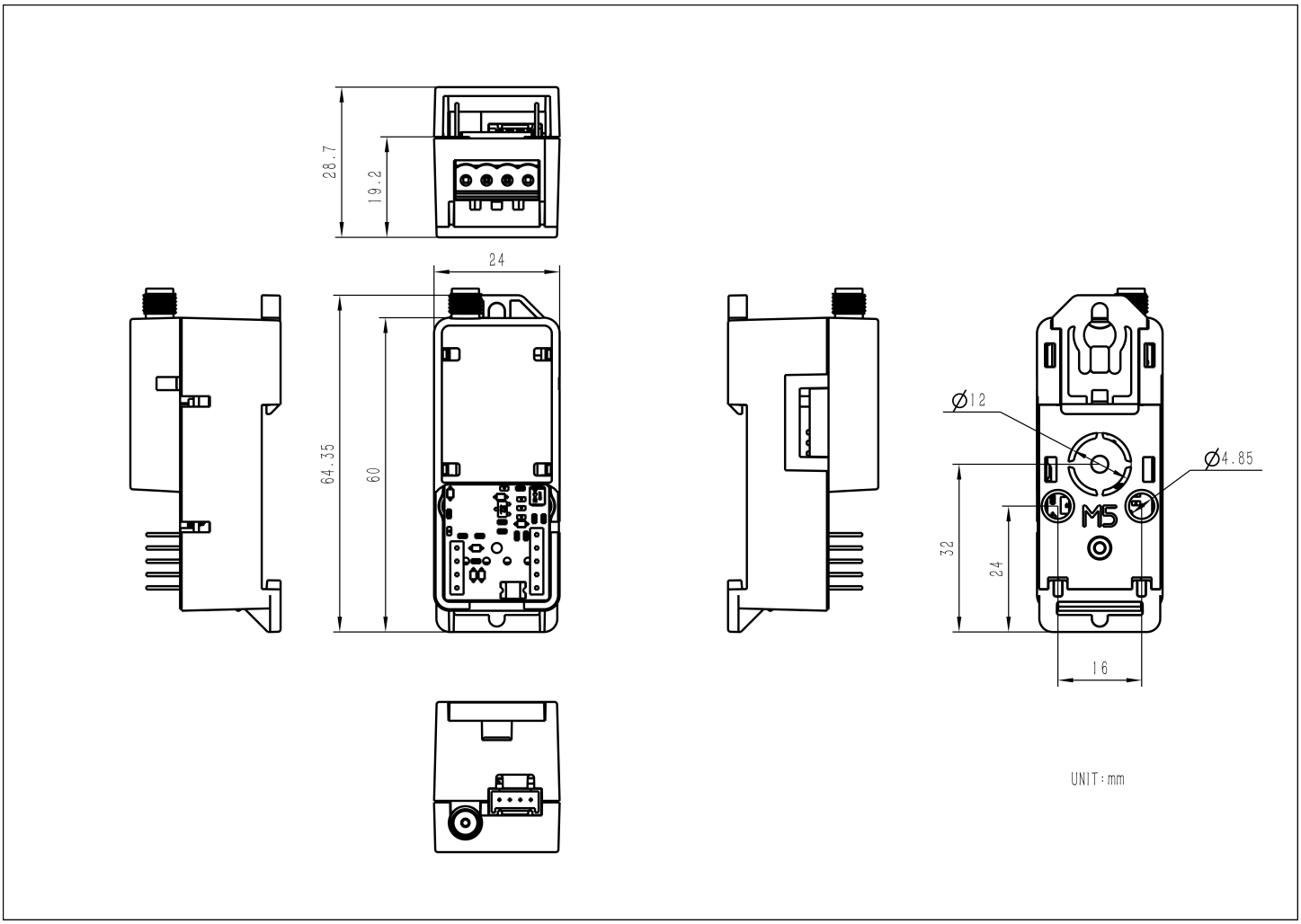


PinMap

PIN	LEFT	RIGHT	PIN
		1	3V3
PORT.A	2	3	NBIoT2_UART_RX
PORT.A	4	5	NBIoT2_UART_TX
5V	6	7	RS485_TX
GND	8	9	RS485_RX

Model Size

- Atom DTU NBIoT2 v1.1 Model Size PDF



Datasheets

- SIM7028_Specification
- SIM7028 Series_Network Searching_Application Note_V1.00
- SIM7028 Series_Low Power Mode_Application Note_V1.01
- SIM7028_NCC_Certificate_20230421

- SIM7028 Series_TCPIP_Application Note_V1.04
- SIM7028 Series_SSL_Application Note_V1.00
- SIM7028 Series_MQTT(S)_Application Note_V1.03
- SIM7028 Series_LwM2M_Application Note_V1.02
- SIM7028 Series_HTTP(S)_Application Note_V1.04
- SIM7028 Series_FOTA_Application Note_V1.00
- SIM7028 Series_COAP_Application Note_V1.00
- NB-EVB_User_Guide_Manual_V1.00
- RSU062-EE-EUT Photo-SIM7028
- RSU062-E6-CE EMC Test Report
- RSU062-E5-3GPP (LTE Band 5) Test Report

Softwares

Arduino

- Atom DTU NBIoT2 v1.1 Arduino Quick Start
- Atom DTU NBIoT2 v1.1 Arduino IO Expansion Driver Library
- TinyGSM Driver Library

UiFlow2

- Atom DTU NBIoT2 v1.1 UiFlow2 Docs

Protocol

- M5IOE1 IO Expansion Management Chip
- SIM7028 Series_AT Command Manual_V1.00

Video

- Atom DTU NBIoT2 v1.1 Product Introduction and Feature Demonstration

A106-V21_Atom_DTU_NBoT2_v1.1_video_EN.mp4

Product Comparison

Product Compare			
	Atom DTU NBIoT2 v1.1	**Atom DTU NBIoT2**	**Atom DTU NBIoT**
Included Atom	Not included	AtomS3-Lite	Atom-Lite
Communication Module	SIM7028	SIM7028	SIM7020G
Cat-NB Band	B1/B2/B3/B4/B5/B8/B12/ B13/B14/B17/B18/B19/B20/B25/ B26/B28/B66/B70/B85	B1/B2/B3/B4/B5/B8/B12/ B13/B14/B17/B18/B19/B20/B25/ B26/B28/B66/B70/B85	B1/B2/B3/B4/B5/B8/B12/ B13/B17/B18/B19/B20/B25/B26 /B28/B66/B70/B71/B85
Data Rate	127 (DL) / 159 (UL)	127 (DL) / 159 (UL)	126 (DL) / 150 (UL)
Module Power Enable	IO Expansion Chip Control	Direct Power Connection	Direct Power Connection
Module Reset	IO Expansion Chip Control	None	None
Power Status Monitoring	IO Expansion Chip ADC Sampling	None	None