EBYTE E49-400T20D

EBYTE E49-400T20D Wireless Module User Manual

Model: E49-400T20D

Brand: EBYTE

1. Introduction

The EBYTE E49-400T20D is an ultra-high cost-effective wireless module designed for reliable and long-range data transmission. It operates in the 410-510MHz frequency band, offering a maximum transmit power of 20dBm (100mW) and a communication distance of up to 2.5km. This module is suitable for a wide range of industrial-grade applications, ensuring robust performance and consistency.

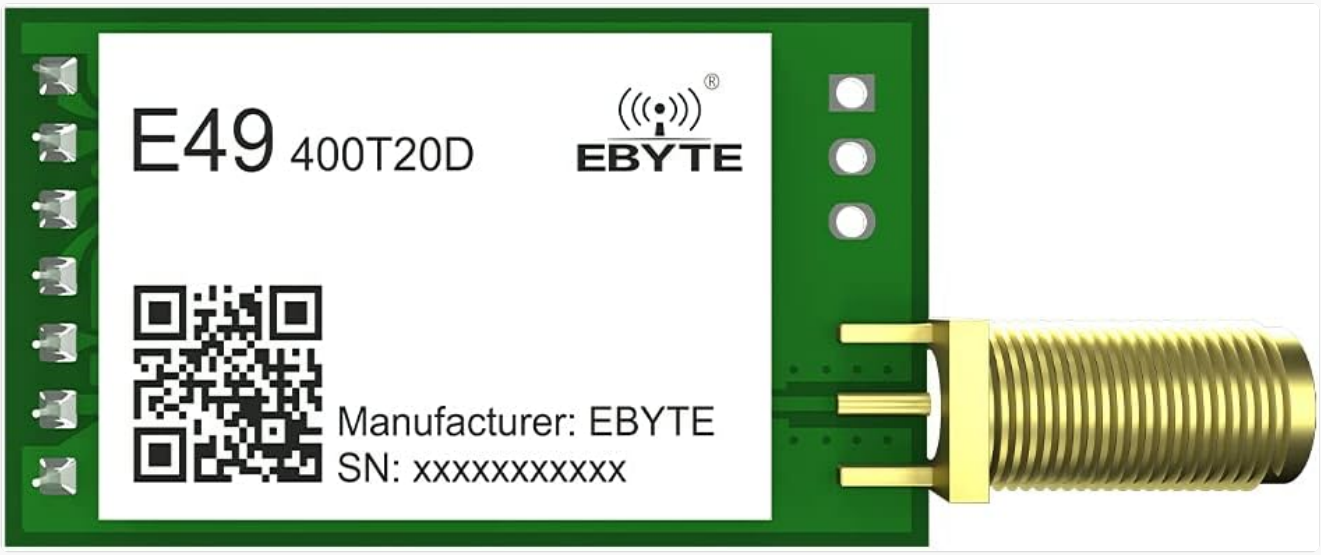

Figure 1: EBYTE E49-400T20D Wireless Module with SMA antenna interface.

2. Features

- Measured communication distance up to 2.5km.

- Maximum transmit power of 100mW (20dBm), software adjustable at multiple levels.
- Utilizes the global license-free ISM 433MHz frequency band.
- Data transmission rate: 1.2Kbps to 200Kbps.
- Low power consumption mode, ideal for battery-powered applications.
- GFSK modulation for reliable data transfer.
- Operating voltage range: 2.6V to 3.3V.
- Industrial-grade standard design for long-term use in temperatures from -40°C to 85°C.
- SMA antenna interface for easy connection.
- Data encryption function for enhanced security and reduced interference.

3. Specifications

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Main Parameters	Description
Product Size	36*21mm
Antenna	SMA
working frequency	410～510MHz
Max Tx power（dBm）	20.0dBm
Reference distance	2.5km
Operating voltage	2.6~5.5V
Communication Interface	UART
Receiving sensitivity	-116~--117kbps
Sleep current	0.7μA

Figure 2: Main technical parameters of the E49-400T20D module.

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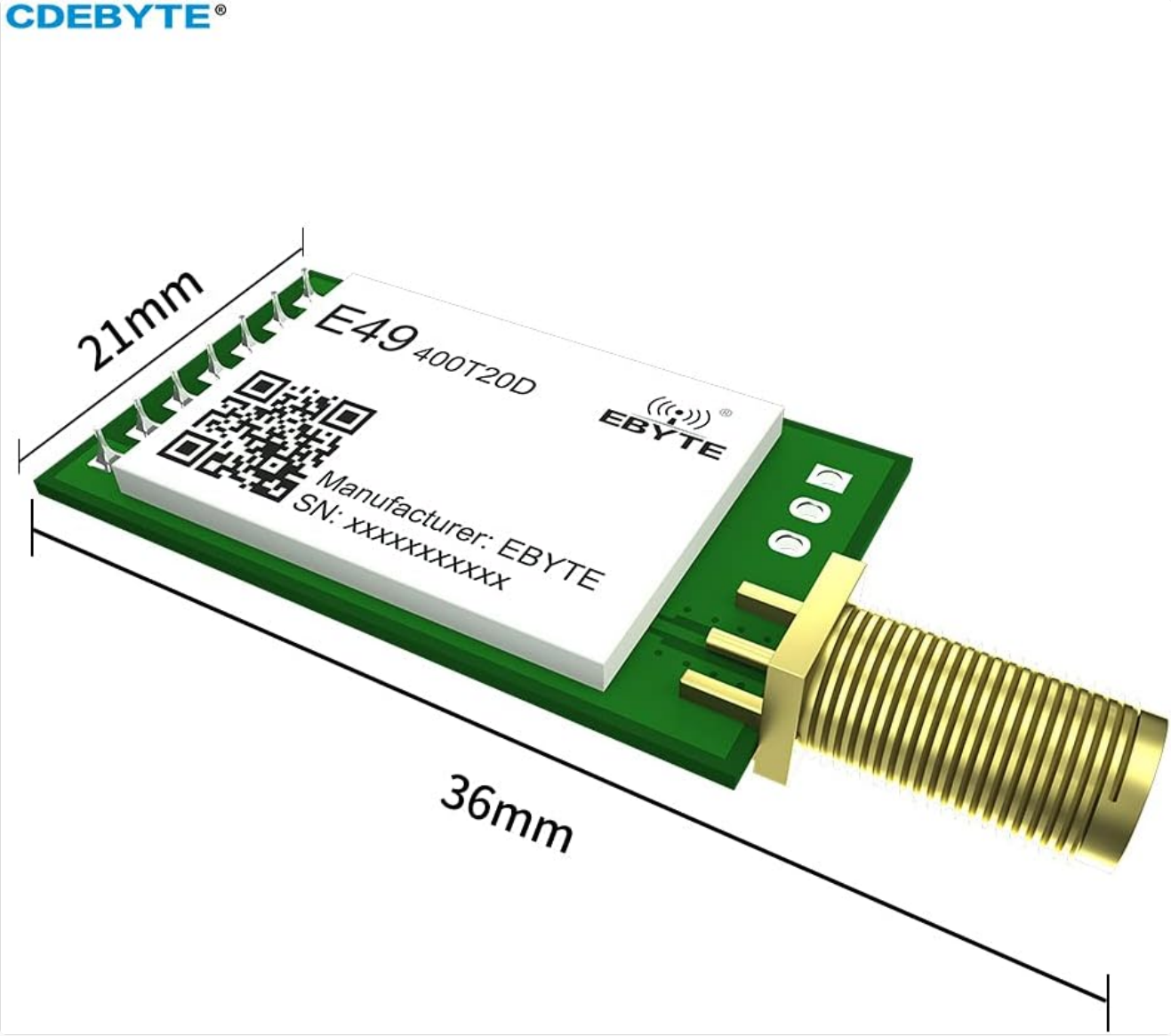


Figure 3: Dimensions of the E49-400T20D module (36mm x 21mm).

4. Setup

To set up the E49-400T20D wireless module, follow these general guidelines:

1. **Power Supply:** Connect the module to a stable power supply within the 2.6V to 3.3V range. Ensure correct polarity to prevent damage.

2. **Antenna Connection:** Attach a compatible 433MHz/470MHz SMA antenna to the module's SMA interface. A properly connected antenna is crucial for optimal performance.
3. **UART Connection:** Connect the module's UART pins (TX, RX, GND) to your microcontroller or host device. Ensure the baud rate and other serial communication parameters are correctly configured on both ends.
4. **Configuration:** Refer to the module's detailed datasheet for specific register configurations, including setting the desired operating mode, transmission power, and data rate.

5. Operating Modes

The E49-400T20D module features four distinct operating modes, each optimized for different application scenarios. These modes allow for flexibility in balancing power consumption, transmission speed, and range. Users can configure the module to select the most suitable mode for their specific needs.
The module supports configurable air data speeds, ranging from 1.2Kbps to 200Kbps. Higher air data speeds result in faster data transmission and shorter transmission delays, while lower speeds can achieve longer transmission distances.

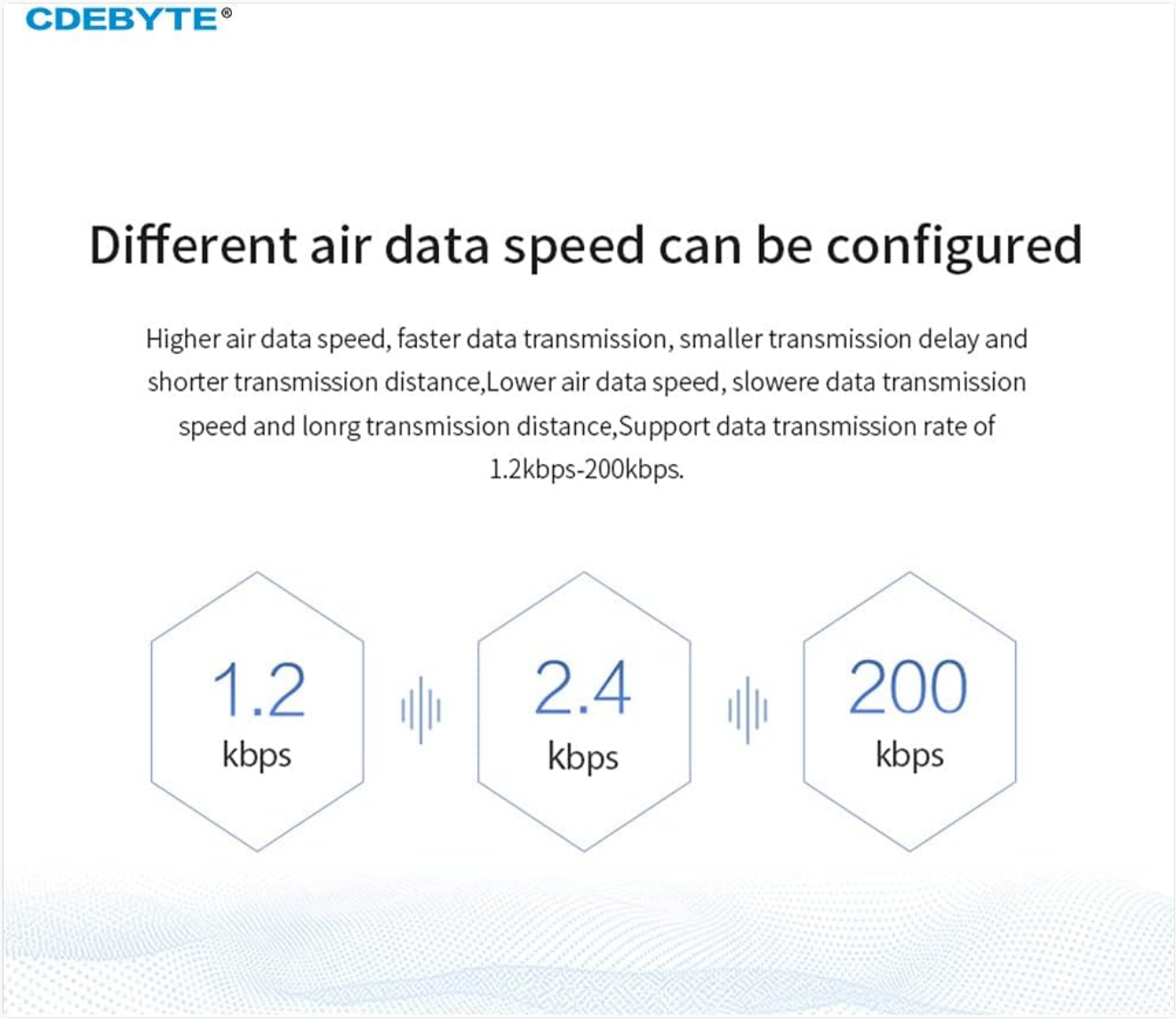


Figure 4: Illustration of configurable air data speeds (1.2kbps, 2.4kbps, 200kbps).

6. Maintenance

To ensure the longevity and optimal performance of your E49-400T20D module, adhere to the following

maintenance guidelines:

- **Environmental Conditions:** Operate the module within its specified industrial-grade temperature range of -40°C to 85°C. Avoid exposure to extreme temperatures, high humidity, or corrosive environments.
- **Handling:** Handle the module with care to prevent physical damage. Avoid static discharge by using appropriate ESD precautions when handling.
- **Cleaning:** If necessary, gently clean the module's exterior with a dry, soft cloth. Do not use liquid cleaners or solvents.
- **Antenna Care:** Ensure the antenna connection is secure and the antenna itself is not damaged. A damaged antenna can significantly reduce performance.

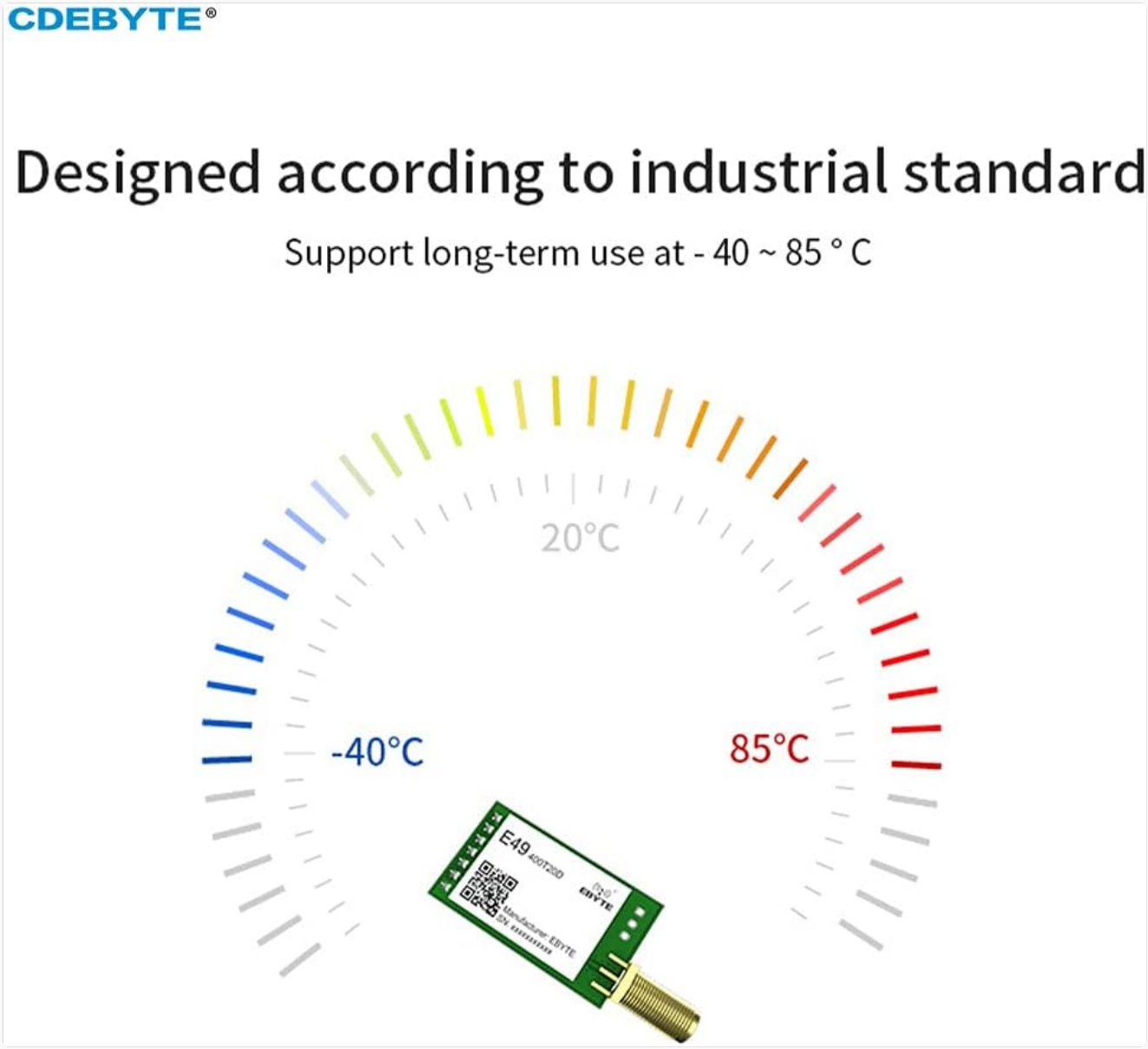


Figure 5: The module is designed for long-term use in temperatures from -40°C to 85°C.

7. Troubleshooting

If you encounter issues with your E49-400T20D module, consider the following troubleshooting steps:

- **No Communication:**
  - Verify power supply voltage and polarity.
  - Check UART connections (TX to RX, RX to TX) and ensure correct baud rate settings.

- Confirm that the module is in an active operating mode and not in a low-power sleep state.

- **Poor Range or Signal Strength:**
  - Ensure the antenna is securely connected and undamaged.
  - Check for obstructions between modules (e.g., walls, metal objects).
  - Verify that the transmit power is set to the desired level (e.g., 20dBm for maximum range).
  - Consider environmental interference from other RF devices.

- **Module Not Responding:**
  - Perform a power cycle (turn off and on) to reset the module.
  - Recheck all wiring connections.

8. Applications

The EBYTE E49-400T20D module is versatile and suitable for a wide array of IoT and industrial applications, including but not limited to:

- Wearable devices
- Smart home and industrial sensors
- Security systems and positioning systems
- Wireless remote control and unmanned drones
- Wireless game remote controls
- Healthcare products
- Wireless voice communication and wireless headsets
- Automotive industry applications

Figure 6: Various IoT application scenarios for EBYTE products, including smart home, remote control, access control, and security systems.

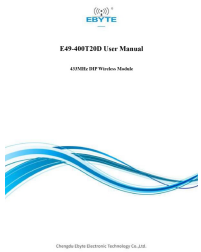
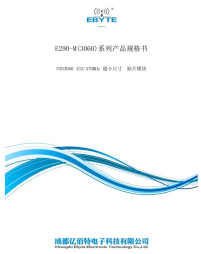
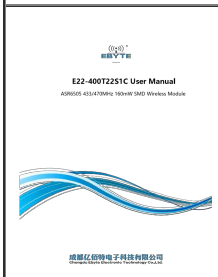
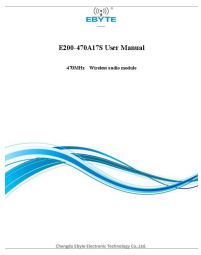
9. Warranty and Support

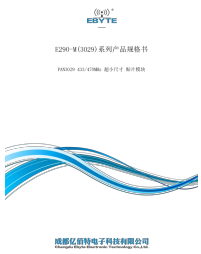
For warranty information, technical support, or further inquiries regarding the EBYTE E49-400T20D module, please contact the manufacturer directly. EBYTE products undergo rigorous testing to ensure industrial reliability and batch consistency.

Manufacturer: Chengdu Ebyte Electronic Technology Co. Ltd.
Website: www.cdebyte.com
EU Representative: evalmaster Consulting GmbH

Figure 7: Product packaging displaying manufacturer and EU representative information.

Related Documents - E49-400T20D

	EBYTE E49-400T20D User Manual: 433MHz DIP Wireless Module User manual for the EBYTE E49-400T20D 433MHz DIP Wireless Module. Covers specifications, features, applications, hardware design, operating modes, command formats, and troubleshooting. Developed by Chengdu Ebyte Electronic Technology Co.,Ltd.
	E290-M(3060) - EBYTE E290-M(3060) EBYTE PAN3060 433/470MHz ChirpIoT™
	E220-400M30S LLCC68 433/470MHz 1W SPI SMD LoRa Module Technical Specification Detailed technical specifications, features, application notes, and guidance for the EBYTE E220-400M30S LoRa module, featuring LLCC68 chip, 1W transmit power, and 433/470MHz frequency band.
	E22-400T22S1C User Manual: ASR6505 433/470MHz LoRa Wireless Module Comprehensive user manual for the EBYTE E22-400T22S1C LoRa wireless module. Covers specifications, features, applications, hardware design, and troubleshooting for this 433/470MHz SMD module.
	EBYTE E200-470A17S: 470MHz Wireless Audio Module User Manual Comprehensive user manual for the EBYTE E200-470A17S, a 470MHz wireless audio transmission module. Learn about its features, specifications, hardware design, and applications.



[E290-M(3029) Series Product Specification | Ebyte]

Detailed specifications for the Ebyte E290-M(3029) series wireless modules, featuring PAN3029 chip and ChirpIoT™ technology for 433/470MHz IoT applications. Covers features, parameters, and usage.