

INDUSTRIAL PRODUCT DATASHEET

Wio-LR2021 Wireless LoRa Module (Tape Reel) | Semtech LR2021 | LoRa | Sub-GHz | 2.4GHz ISM

Wio-LR2021 is a dual-band, multi-protocol LoRa module with 2.6 Mbps FLRC and -141.5 dBm sensitivity for global, energy-efficient IoT connectivity.

SKU

100058045

UPDATED

2026-09-21 09:59:16

PRICE

\$6.99(Excl. VAT)



Overview



The Wio-LR2021 Wireless LoRa Module (Tape Reel) integrates Semtech LR2021 with dual-band Sub-GHz and 2.4 GHz ISM support, enabling global compliance with a single SKU. It delivers FLRC high-speed 2.6 Mbps data rates, multi-protocol LoRa/FLRC/FSK/OQPSK flexibility, and superior -141.5 dBm receive sensitivity for applications from global tracking to high-speed OTA updates.

Key Features

- **2.6Mbps High-Speed Breakthrough**

Beyond traditional sensor telemetry, the Wio-LR2021 introduces **FLRC modulation**, achieving **2.6 Mbps**—nearly 9× faster than legacy FSK. This speed unlocks bandwidth-sensitive applications previously impossible on LPWAN: real-time audio streaming, compressed image transmission, and bulk firmware updates. One hardware platform now spans from ultra-low-power utility meters to bandwidth-hungry surveillance endpoints, expanding your addressable market without additional radio components.

- **One SKU, Global Coverage**

Eliminate regional fragmentation with a true dual-band architecture covering Sub-GHz (868-915 MHz) and 2.4 GHz ISM, unified by a revolutionary switch-less RF front-end. A single hardware design satisfies FCC, CE, and global regulatory requirements, slashing certification cycles and inventory complexity. For product managers, this means launching worldwide with one BOM—No more juggling multiple regional variants or navigating fragmented supply chains.

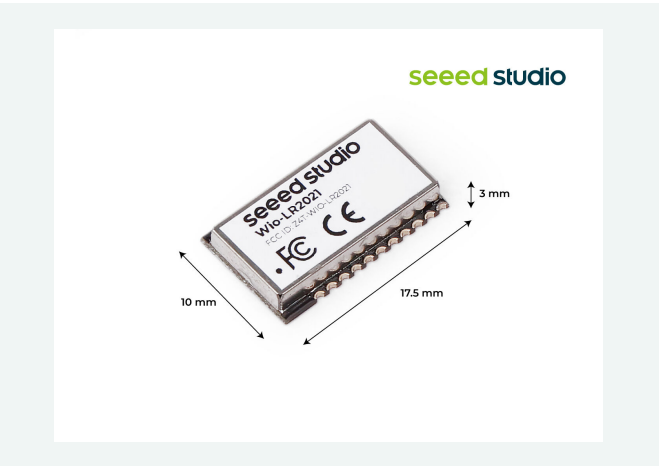
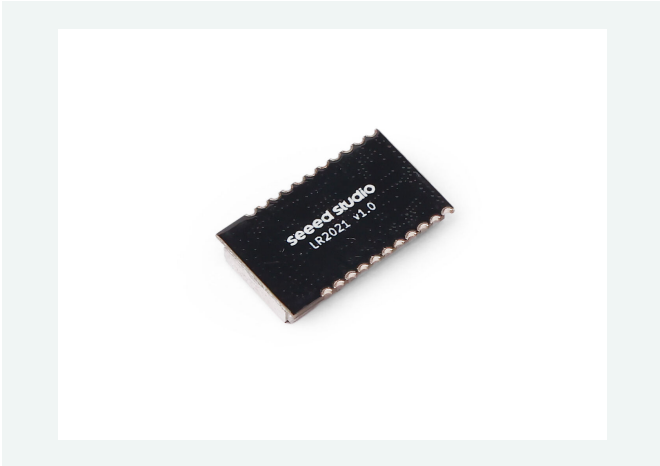
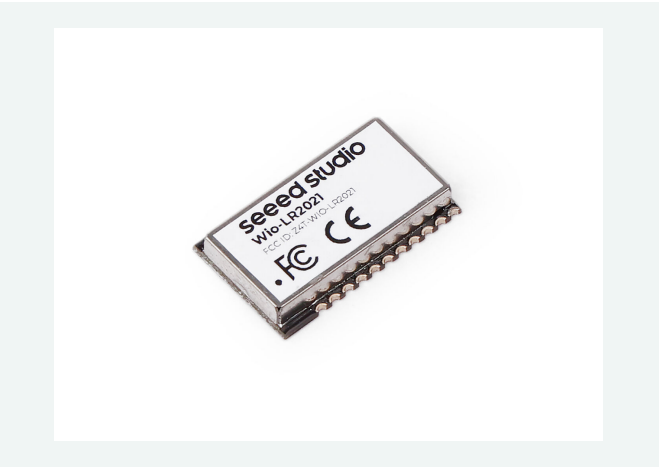
- **Universal Platform**

Integrating **LoRa**, **FLRC**, **FSK**, and **OQPSK** modulations with native support for **Amazon Sidewalk**, **W-MBUS**, **Wi-SUN**, and **Z-Wave**, Wio-LR2021 is the most suitable choice to serve as a versatile platform for accommodating various upper-layer protocols. Developers can optimize for scenario-specific needs through software configuration alone—from ultra-low-power for agricultural sensors to high-throughput for industrial controls. This protocol agility future-proofs your investment against evolving standards and customer requirements.

- **Leap in Energy Efficiency**

Outperforming predecessors like the SX1262 across critical metrics, the Wio-LR2021 delivers lower transmission current and superior -141.5 dBm receive sensitivity. In practical terms: your devices connect reliably at the edge of coverage where competing radios fail, while battery-operated sensors achieve decade-long lifespans. The efficiency gains translate directly to reduced maintenance costs and enhanced user trust for mission-critical deployments.

Product Gallery

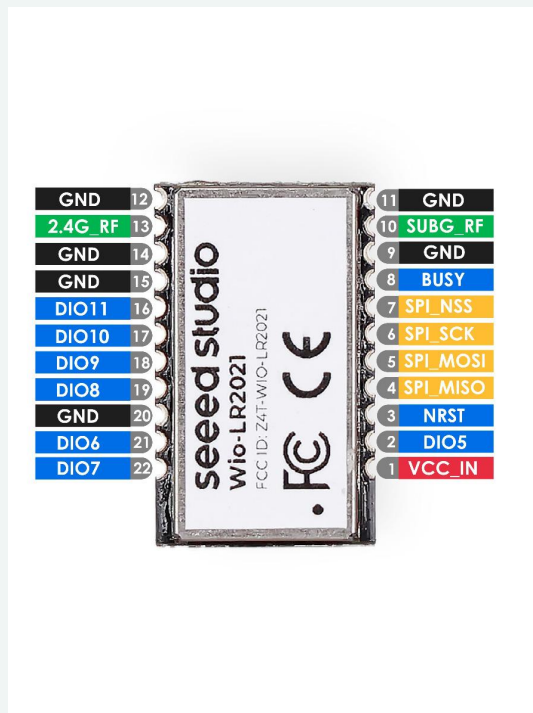


Specification

Main Chip	LR2021
Size	17.5*10*3 mm
Package	22 Pins, SMT

Frequency	863-928MHz; 2.4-2.5GHz
Power Supply	Typical 3.3V
Power Distribution Mode	SIMO / LDO
TCXO Supply Mode	VTCXO Pin
TCXO Supply Voltage	3V (software configurable)
Maximum Operation Current (LoRa Transmitter)	119.4mA @ 915MHz, Tx 22dBm 33.6mA @ 868MHz, Tx 14dBm 28.4mA @ 2.4GHz, Tx 12dBm
Maximum Operation Current (LoRa Receiver)	8.19mA @ Sub-GHz, SF12, BW=125kHz 8.59mA @ 2.4GHz, SF12, BW=125kHz
Sleep Current	583nA
Idle Current	960uA
Maximum Output Power	22dBm @ SubGHz 12dBm @ 2.4GHz
Receiver Sensitivity	RxBoost ON : -127.5dBm @ SubGHz, BW=125KHz, SF = 7 -141.1dBm @ SubGHz, BW=125KHz, SF = 12 -118.4dBm @ 2.4GHz, BW=125KHz, SF = 7 -133dBm @ 2.4GHz, BW=125KHz, SF = 12
Working Temperature	-40 ~ 85 °C
Units per Reel	1200pcs

Hardware Overview



Applications

- **Global Shipping and Logistics Tracking:** Enable seamless global asset tracking. Wio-LR2021 allows devices to automatically comply with regional radio standards, providing uninterrupted data from port to port.
- **Wireless Video & Image Transmission:** With FLRC speeds up to 2.6 Mbps, Wio-LR2021 sends images within a second, enabling low-power visual monitoring for security, industrial, and environmental applications.
- **Audio Communication:** Wio-LR2021 makes low-power audio communication practical—enabling safety intercoms on remote worksites, spoken alerts for equipment and voice-activated sensing in smart environments.
- **Converged Network:** Unify dedicated short-range networks (for high-speed data collection) and wide-area networks (for continuous cloud connectivity) on a single device. This architectural shift eliminates redundant infrastructure.
- **High-Speed OTA for Critical Assets:** Wio-LR2021's high-throughput link ensures robust and rapid firmware updates. It enables guaranteed zero-downtime updates for critical infrastructure sensors.

Part List

Wio-LR2021 (Tape Reel)	x1
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Compliance & Logistics

HSCODE	8517799000
USHSCODE	8517620090
UPC	
EUHSCODE	8517180000
COO	CHINA

Resource Links

- <https://www.seeedstudio.com/Seeed-Studio-Wio-LR2021-Wireless-module-868-915MHz-Tape-reel-p-6831.html>
- [Wio-LR2021 Module Datasheet](#)
- [Semtech LR2021 Datasheet](#)
- [Wio-LR2021 Module Mechanical Drawing](#)
- [Wio-LR2021 Module 3D Model](#)
- [Wio-LR2021 Module KiCad Library](#)
- [Wio-LR2021 Module Allegro Library](#)

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