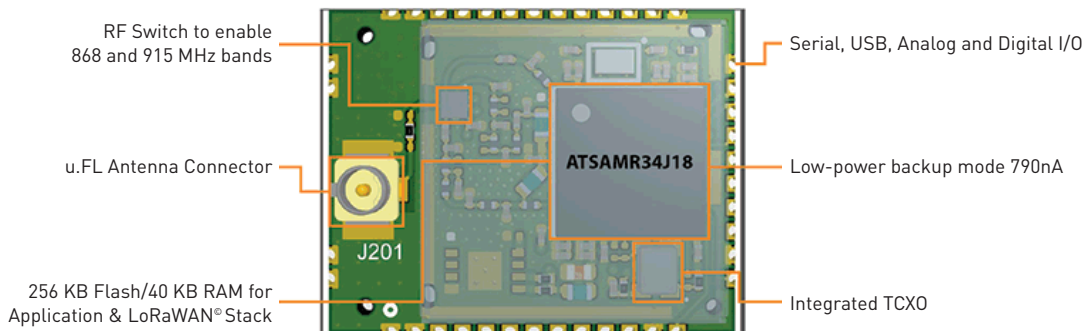# LoRa Wireless Module WLR089U0

The WLR089U0 module is an ultra-low power, regulatory certified LoRa module based on the ATSAMR34J18 LoRa IC. This standalone module includes a 32-bit ARM® Cortex®-M0+ processor and offers 256KB of Flash and 40KB of SRAM (8KB battery backed) in a compact 17 x 13.5 mm package. With ultra-low power sleep currents as low as 790nA, the WLR089U0 modules are ideal for battery powered remote sensor applications.

The module also includes a 32.768 kHz crystal, 32 MHz TCXO, RF switch, impedance matching circuits, Low Pass Filter (LPF) and required RF shielding and USB, making it suitable for USB dongle applications or for software updates via USB.

Features:

- Fully certified LoRa Module (SAMR34)
- Designed for long battery life
- Standalone module with 256 KB flash and 40KB RAM

- 863 to 928 MHz dual-band coverage
- Compact surface mount module: 17 mm x 13.5 mm size
- FCC, IC and RED certified

RF Switch to enable 868 and 915 MHz bands

u.FL Antenna Connector

256 KB Flash/40 KB RAM for Application & LoRaWAN© Stack

Serial, USB, Analog and Digital I/O

Low-power backup mode 790nA

Integrated TCXO

RF/Analog Features

- Integrated LoRa Technology Transceiver:
  o 863 MHz to 928 MHz dual-band coverage
  o +18.59 dBm maximum power (VCC > 2.4 VDC)
- High Sensitivity: -136 dBm (LoRaWAN® protocol compliant modes)
- Up to 154.59 dB Maximum Link Budget
- Robust Front-end: IIp3 = -11 dBm
- Excellent Blocking Immunity

- Fully Integrated Synthesizer with a Resolution of 61 Hz
- LoRa Technology and (G)FSK Modulations
- Preamble Detection
- 127 dB Dynamic Range RSSI
- Automatic RF Sense and Channel Activity Detection (CAD) with Ultra-Fast Automatic Frequency Control (AFC)
- Packet Engine up to 256 Bytes with Cyclic Redundancy Check (CRC)

The highly configurable module peripherals include up to 4 SERCOMs (configurable as I2C/SPI /UART/LIN interfaces) with one in the low power domain, 7 12-bit ADC channels and 2 analog comparators. The module supports LoRa, FSK, MSK and OOK modulations and delivers up to 18.6 dBm TX power with an RX sensitivity down to -136 dBm.

Design-in Expertise and Service

140640A

WLR089U0 and SAM R34/35 Software Features

◆ Microchip LoRaWAN stack

◆ Developed, maintained and supported by Microchip

◆ Supports Class A and Class C modes of operation

◆ LoRaWAN 1.0.4 regional parameters

◆ Multi-region support: US915, EU868, AS923, AU915, KR920, IN865 bands supported

◆ Proven operation with leading network providers including Actility, Senet, The Things Network and Everynet

Development

The WLR089 Xplained Pro Development Kit (EV23M25A) integrates the FCC-, RED- and ISED-certified WLR089U0 module and includes an on-board debugger, current measurement circuitry and extension headers to connect to additional boards. Supported by Atmel Studio Integrated Development Environment (IDE), software examples and a LoRaWAN stack, this development board greatly simplifies the development of LoRa technology end nodes.
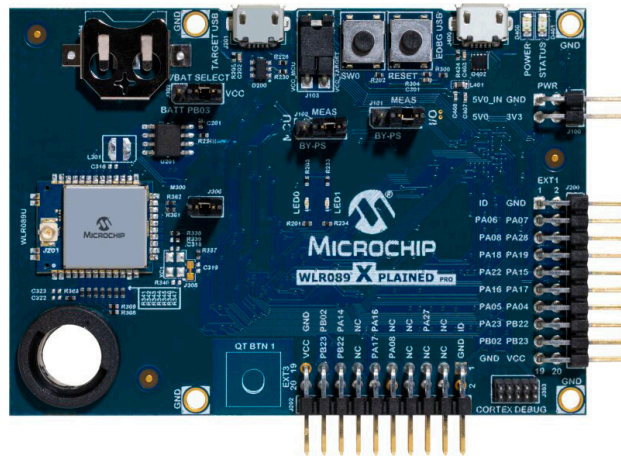
Only These Three Steps to Get Started:

◆ Download and install Atmel Studio Integrated Development Environment

◆ Connect DEBUG USB on the kit to your computer

◆ Select example demos from Advanced Software Framework (ASF)

Design-in Expertise and Service