



# SAM R34/35 LoRa® Devices and WLR089U0 LoRa Modules

Ultra-Low Power LoRa Devices for Long-Range, Low-Power Designs

## Summary

Accelerate your next IoT design with our highly integrated SAM R34/35 LoRa® family of devices. These devices include an ultra-low power, high-performance 32-bit microcontroller (MCU), LoRa transceiver and software stack, making them ideal for battery-powered remote IoT node applications. With certified reference designs, and proven interoperability with major LoRaWAN® gateway and network providers, the SAMR R34/35 ICs and the WLR089U0 module devices significantly simplify development and reduce the time to market for Internet of Things (IoT) designs.

## Applications

### Smart Agriculture

- Cattle tracking
- Irrigation monitoring
- Smart tractors



### Supply Chain and Logistics

- Vehicle tracking
- Cold chain monitoring
- Container tracking



### Smart City

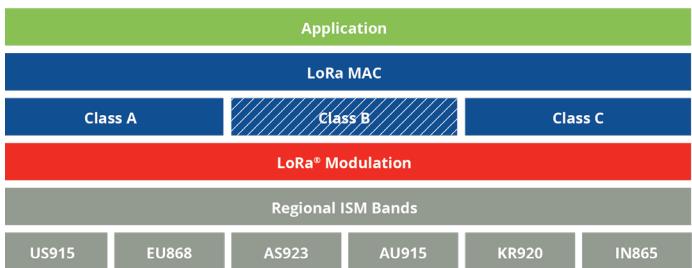
- Street lighting
- Waste management
- Metering and leak detection

## Key Features and Benefits

- Create smaller IoT end-nodes
  - Integrated 32-bit Arm® MCU and Sub-GHz Radio
  - Up to 256 KB Flash and 40 KB RAM
  - Compact 6 × 6 mm BGA package ICs and small 17.5 × 13.5 mm SMT module
- Increase battery life
  - Ultra-low power 32-bit Arm Cortex® MCU
  - Sleep currents down to 790 nA
  - Low-power RAM with battery back-up
- Reduce your design risk
  - Certified module with u.FL connector
  - Certified IC reference design package
  - Interoperability-tested software
  - Trusted supply chain

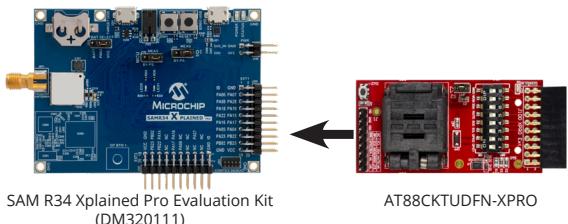


## Proven LoRaWAN® Software



At the heart of every LoRaWAN end-node is the LoRaWAN stack. We simplify your LoRaWAN software development by providing a proven LoRaWAN stack. Our LoRaWAN stack supports class A and class C modes of operation to support a variety of applications from battery powered sensors to main powered actuators. Multiple regions and geographies including US915, EU868, AS923, AU915, KR920 and IN865 bands are supported. We have tested the operation with leading gateway and network providers across the world.

## Enhanced Security



Provisioning and storing network server and application server keys is one of the key requirements of any LoRa system. However, this requirement also leads to a known security weakness - attackers may try to exploit your system by accessing these keys. This can be avoided by implementing a secure hardened key storage both at the node and in the LoRaWAN backend which will strengthen the authentication process by removing exposure of authentication keys to software, firmware, manufacturing sites, end users and other third parties. Microchip's secure elements—ATECC608B-TNGLO-RA for The Things Industries (TTI) and ATECC608B-TNGACT for Actility—are pre-provisioned with the corresponding authentication keys and provide a JIL "high" rated secure key storage to isolate keys in the nodes.

## Development Made Easy

### Follow These Easy Steps to Get Started

- Purchase the SAMR34 Xplained Pro Evaluation Kit or the WLR089 Xplained Pro Development Kit
- 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)

### Available Documentation and Resources

- For all SAM R34/35 and WLR089U0 documentation: [SAM R34/35 LoRa Family Webpage](#)
- To get started with LoRa security: [LoRa Secure Authentication Webpage](#)
- Buy/Sample WLR089U0 module: [WLR089U0 module on microchipDirect](#)

Part Number	Description	Flash	RAM	Development Tool
<b>ATSAMR34J16</b>	Ultra-low power microcontroller with USB and UHF transceiver communication interface and 32-bit Arm® Cortex®-M0+ processor	64 KB	12 KB	SAM R34 Xplained Pro Evaluation Kit (DM320111)
<b>ATSAMR34J17</b>	Ultra-low power microcontroller with USB and UHF transceiver communication interface and 32-bit Arm Cortex-M0+ processor	128 KB	24 KB	SAM R34 Xplained Pro Evaluation Kit (DM320111)
<b>ATSAMR34J18</b>	Ultra-low power microcontroller with USB and UHF transceiver communication interface and 32-bit Arm Cortex-M0+ processor	256 KB	40 KB	SAM R34 Xplained Pro Evaluation Kit (DM320111)
<b>ATSAMR35J16</b>	Ultra-low power microcontroller combined with a UHF transceiver communication interface and 32-bit Arm Cortex-M0+ processor	64 KB	12 KB	SAM R34 Xplained Pro Evaluation Kit (DM320111)
<b>ATSAMR35J17</b>	Ultra-low power microcontroller combined with a UHF transceiver communication interface and 32-bit Arm Cortex-M0+ processor	128 KB	24 KB	SAM R34 Xplained Pro Evaluation Kit (DM320111)
<b>ATSAMR35J18</b>	Ultra-low power microcontroller combined with a UHF transceiver communication interface and 32-bit Arm Cortex-M0+ processor	256 KB	40 KB	SAM R34 Xplained Pro Evaluation Kit (DM320111)
<b>WLR089U0</b>	Ultra-low power, regulatory certified LoRa module based on the ATSAMR34J18 LoRa IC	256 KB	40 KB	WLR089 Xplained Pro Development Kit (EV23M25A)