# Robust Security, Ultra-Low Power and Superior Touch

SAM L10/L11 MCU Family

## Summary

The SAM L10 and L11 microcontroller family is the industry's first 32-bit MCU family featuring, robust chip-level security and Arm® TrustZone® Technology. Available in two variant option, SAM L10 and SAM L11, these MCUs boast the industry's lowest power consumption in their class, enhanced Peripheral Touch Controller and advanced analog features. The SAM L11 variant adds integrated hardware security and is supported by the Comprehensive Security Solution Framework which includes Trustonic's Kinibi-M and Secure Thingz key provisioning services. Available in 24- and 32-pin package options, these MCUs take an innovative approach to solving the challenges faced by the designers of IoT, security, low-power, capacitive touch and general-purpose embedded control applications.


## Key Features

- Up to 64 KB Flash and 16 KB SRAM
- 32 MHz Arm Cortex® M23 Core
- picoPower® Technology
  - less than 25 µA/MHz in active mode
  - less than 100 nA in sleep mode
  - Fast wakeup time: 1.5 µS
  - Flexible power saving features
- EEMBC certified ULP mark score: 405
- Enhanced Peripheral Touch Controller (PTC)
  - Superior water tolerance, noise immunity and responsiveness
- Robust security
  - Chip-level tamper resistance
  - Arm TrustZone technology
  - Secure boot
  - Secure bootloader
  - Crypto accelerators
  - Secure key storage
- Op amp ADC and DAC

## Target Applications

- Low power
  - Wearables
  - Gaming controls
  - Energy harvesting
  - Smart pens
  - Low-power industrial
- Capacitive touch
  - Appliances
  - Fitness trackers
  - Automotive door handles
  - Steering wheel controls
  - Key pads and remote controls
- IoT and security
  - Smart cities
  - Home automation
  - Industrial automation
  - Smart agriculture
  - Medical devices
  - Accessories authentication
- General-purpose embedded control

## Package Options

| Package | VQFN | TQFP | WLCSP* | VQFN | SSOP |
|---|---|---|---|---|---|
| **Pins** | 32 | 32 | 32 | 24 | 24 |
| **Dimensions (mm)** | 5 × 5 | 7 × 7 | 2.8 × 2.8 | 4 × 4 | 8.2 × 5.3 |

Temperature Options: –40 to 85ºC and –40 to 125ºC

AEC-Q100 Grade 1*

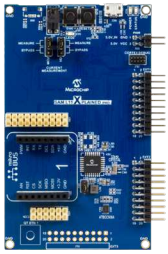
*Contact local sales for availability

## Rich Development Ecosystem

The SAM L10/L11 family is supported by a rich development ecosystem that will simplify your development effort and shorten your design time to get your products to market faster.

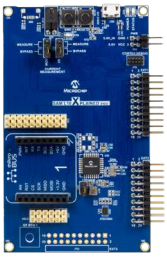
| | |
|---|---|
| **Integrated Development Environment (IDE)** | Atmel Studio 7<br>IAR Embedded Workbench<br>Arm® Keil® MDK |
| **Software Framework** | Atmel START<br>Atmel START TrustZone® Manager |
| **Security Framework** | Trustonic Kinibi-M<br>Secure Thingz Key Provisioning |
| **Low Power** | Power Debugger<br>Data Visualizer |
| **Touch** | QTouch® Configurator<br>QTouch Modular Library<br>2D Touch Surface Library |

### SAM L11 Xplained Pro Evaluation Kit (DM320205)



The SAM L11 Xplained Pro Evaluation Kit is ideal for evaluating and prototyping with ultra low power SAM L11 Arm Cortex-M23 based microcontrollers featuring chip-level security and Arm TrustZone Technology.

### SAM L10 Xplained Pro Evaluation Kit (DM320204)



The SAM L10 Xplained Pro Evaluation Kit is ideal for evaluating and prototyping with the ultra low power SAM L10 Arm Cortex-M23 based microcontrollers.

The Xplained Pro evaluation kits are supported with various demo examples and feature mikroBUS™ socket and Xplained Pro extension headers to expand your development with MikroElektronika click boards and Xplained Pro extension kits.

| Featured Demo Examples | Description |
|---|---|
| **Trusted Execution Environment** | Trusted execution of low power temperature sensor application and SAM L11 counter acting malicious code attacks |
| **Secure LoRa® IoT Node*** | SAM L11 securely transmits light sensor information to The Things Network (TTN) gateway. Leverages security features to recover the sensor-node incase of code failure |
| **Amazon Web Services (AWS) Enrollment*** | SAM L11 hosts Trustonic's Kinibi-M and securely connects to the AWS cloud |
| **Low-Power Weather Station** | Implements ultra-low power features and low power analog of SAM L10 to provide environment data using MikroElektronika click boards |
| **SleepWalking** | Implements SleepWalking and dynamic power gating for ultra-low power consumption |
| **Water-Tolerant Touch** | Showcases Driven Shield Plus capability to help design exceptional water tolerant touch interface |
| **Low-Power Key Pad** | Implements wakeup on touch feature of SAM L10/L11 for ultra-low power key pad design |

*Contact local sales for availability



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