Gecko® MCUs

Energy-friendly microcontrollers for the IoT

PRODUCT SELECTOR GUIDE

Gecko MCUs
Complete portfolio of energy-friendly 32-bit microcontrollers
Everything you need to create a more connected world.

Based on ARM® Cortex®-M0+, Cortex-M3 and Cortex-M4 cores, Gecko MCUs also include the most energy-friendly peripherals and energy modes to enable design of highly functional low power systems.

“Our portfolio was designed to help you innovate. Gecko MCUs and Wireless Geckos are built on the same architecture so you can leverage a single set of software, tools, and experience and focus on what really matters.”

— Alessandro Piovaccari | Senior Vice President and Chief Technology Officer

**Sense**
Intelligent sensor solutions with superb reliability, compact size, high levels of integration and unmatched ease of use for a variety of applications.

- Temperature
- Humidity
- Optical
- Touch
- Proximity

**Simplify**
Get up and running quickly with precompiled demos, application notes and examples. Use advanced tools including energy profiling and network analysis to optimize your MCU and wireless systems.

- Simplicity Studio®
- Energy Profiler™
- Network Analyzer
- Rich Software Ecosystem

**Compute**
The computing power you need with power efficiency you didn’t know was possible.

- Autonomous
- Low Power
- Signal Processing
- Mixed Signal
- Easy to Use

**Communicate**
Connectivity is at the heart of the IoT, and our wireless portfolio is how you achieve it.

- Zigbee
- Thread
- WiFi
- Bluetooth® Smart
- Proprietary

**Compute**
The computing power you need with power efficiency you didn’t know was possible.

- Autonomous
- Low Power
- Signal Processing
- Mixed Signal
- Easy to Use

**Communicate**
Connectivity is at the heart of the IoT, and our wireless portfolio is how you achieve it.

- Zigbee
- Thread
- WiFi
- Bluetooth® Smart
- Proprietary

**Simplify**
Get up and running quickly with precompiled demos, application notes and examples. Use advanced tools including energy profiling and network analysis to optimize your MCU and wireless systems.

- Simplicity Studio®
- Energy Profiler™
- Network Analyzer
- Rich Software Ecosystem
The Gecko is excellent at conserving energy. Even in a full resting state it can still maintain awareness of its environment.

Built using Gecko Technology
Gecko MCUs can perform a number of tasks while in deep sleep, optimizing battery life for your application.

Small Form Factor
- High integration – few external components
- WLCSIP packages for minimum footprint
- Gecko Technology minimizes battery size

Highly Scalable
- Breadboard and pin compatibility
- Same architecture for MCUs and RF SoCs
- Small Cortex M0+ to large Cortex M3 and M4

Enabling Software
- Commercial grade Micrium OS
- Solid RF and communication stacks
- Security through accelerated mbedTLS

Development Flow
- Centered around the developer
- Security through accelerated mbedTLS
- High integration – few external components

Low Power. No Compromise.

Low energy capacitive touch solution
- Easy path to radio integration

Interfacing with the World
- TFFT display engines up to 320 x 240 pixels
- Low energy segment LCD driver

CPU and Memory
- Cortex-M0+/M3/M4
- 4, 8, 16, 32 KB Flash
- 8, 16, 32 KB SRAM

Clock Management
- 32 kHz
- 40 MHz
- 75 MHz

Energy Management
- Core voltage regulator
- DC-DC converters
- Brown-out detector

Security
- AES, ECC, SHA, Crypto
- CRC32
- MDM
- MD4

Technical Overview
Gecko MCUs were designed for innovation. The diagram below shows an overview of the wide range of functionality available in the these MCUs. The color coding represents the lowest energy mode the functions are available down to. The ability for peripherals to operate during deep sleep and below allows significant energy savings in low power applications.

To see our portfolio of wireless products visit silabs.com/wireless
Giant Gecko Series 1 32-bit Microcontrollers

For complex, battery-powered IoT applications, Silicon Labs' Giant Gecko Series 1 offers the most-integrated 32-bit MCU at the lowest energy level.

With a powerful Cortex-M4 at 72 MHz, up to 2MB of embedded flash and 512KB of RAM, and advanced peripherals like 10/100 Ethernet, Quad-SPI, LCD control, security accelerators, and more, the Giant Gecko 11 can help overcome challenging requirements of low-power sensing, controlling, and computing.

Efficient Integrated DC-DC Regulator

The Gecko MCUs include a highly efficient integrated DC-DC buck regulator, capable of supplying up to 200 mA to the MCU and surrounding IoT application. The regulator maintains its efficiency even when the system is in deep sleep.

The figure below illustrates one possible DC-DC configuration, driving both MCU and system components, in order to maximize energy efficiency.

- **Minimize Energy Consumption**
  - Integrated high efficiency DC-DC
  - 200 mA for both MCU and application
  - Code execution at 80 μA/MHz
  - Sample sensors with ADC from deep sleep

- **Secure your IoT device**
  - Advanced built-in cryptography
  - ECC / AES / RSA / SHA / CRC
  - True Random Number Generator (RNG)
  - Unique Device Identifier

- **Maximize Capability**
  - Up to 2MB/512KB memory
  - Advanced peripherals — QSPI/SDIO/Eth
  - Display control of segment LCD and TFT
  - Ready to use with Micrium OS

- **Typical DCDC Configurations**
  - Drive full system—maximum energy efficiency
  - Drive MCU—IO and system at higher voltage
  - Disabled—optimize BOM

- **Supply Ranges**
  - Efficient buck operation down to 2.4 V
  - Seamless bypass from 2.4 V to 1.85 V
  - MCU internals and IO range 1.62 V to 3.8 V

- **Flexibility**
  - Work with 1.8 V or 3.3 V system components
  - Optimize for BOM or maximum efficiency
  - Superior ease of use
Simplicity Studio

Simplicity Studio provides one-click access to design tools, documentation, software and support and resources for Gecko MCUs, EFM8 TM, 8051, Wireless Gecko MCUs and SoCs. Simplicity Studio 3.2 now features an enhanced real-time Energy Profiler, 3x faster execution speed and an easier, faster installation process.

Getting Started is Easy

1. Buy a Starter Kit
   The easiest way to begin development
   silabs.com/efm32

2. Download Simplicity Studio
   Get up and running quickly with precompiled demos, application notes and examples.
   silabs.com/simplicity

3. Connect with our Community
   Explore, learn and share.
   community.silabs.com

Energy Profiler
- Real-time analysis of energy consumption
- Correlate current consumption to code

Part Configurator
- Graphical configuration of peripherals and IO
- Automatic validation and code generation

IDE
- Eclipse framework
- Build tools: Keil®, IAR®, GCC
- 3rd party IDEs also supported

Documentation
- One-stop destination for all product documentation

Network Analyzer
- Advanced network debug for wireless products