EFM8™

8-bit microcontrollers without compromise

PRODUCT SELECTOR GUIDE
Select a secure architecture

The EFM8 is based on a Harvard architecture, allowing it to only execute code fetched from program memory and allows locking of program memory to prevent unauthorized examination. These are two advantages in the EFM8 hardware that protect a product from security attacks.

Select a low latency system

Variations in interrupt response time can cause adverse effects in some applications, causing, for example, audio distortion or motor noise and vibration. With the EFM8 it’s easy to work “close to the metal” and have full control over the entire system.

Select a simple solution

The EFM8 microcontroller is ideal for processing 8-bit data that comes from port I/O or sensor inputs. A great many applications don’t require complex mathematics processing and benefit significantly from the code density advantages of an 8-bit processor when not tasked with 16-bit or 32-bit mathematics. Human interface functions, sensor interfaces, and distributed processing functions are examples that easily benefit from the simplicity of the EFM8 solutions.

EFM8 microcontrollers are based on the popular 8051 core. The 8051 architecture ecosystem represents nearly 25% of the existing MCU market.

“Sub-$0.50 MCU prices, tiny footprints, ultra-low power, low software overhead and design simplicity, all prerequisites for IoT devices. Silicon Labs designed the new EFM8 family to deliver best-in-class features and functionality in each of these application-critical areas.”

- IHS, 2015
8 factors that make EFM8 the world’s only no-compromise 8-bit microcontroller.

**Fast Processor Core**
With up to 72 MHz operation and with 70% of the instructions executing in less than 1 or 2 clock cycles, the EFM8 MCUs offer an economical solution that satisfy the performance needs of embedded applications. Also, the efficient architecture reduces memory requirements of the application.

**Efficient Digital Peripherals**
Autonomous digital peripherals reduce the processor overhead and the configurable logic reduces surrounding chip logic. The EFM8 MCUs include high-performance timers, higher resolution PWMs and fast serial communication peripherals including 12 Mbps SPI, 3 Mbps UART and 3.4 Mbps I2C.

**High Performance Analog**
The EFM8 family of MCUs offer high-performance analog peripherals such as 14 bit ADCs at 900 Ksps, 12 bit ADCs at 1 Msp, and 10 bit ADCs at 1.125 Msp, high noise immune capacitive sensing peripherals and temp sensors that reduce the system cost and simplify designs.

**Highly Integrated**
The EFM8 family features high-precision oscillators, integrated on-board voltage regulator, USB charger detect circuitry and high performance peripherals in packages as small as 1.65x1.78 mm to reduce the PCB area and BOM cost.

**No Performance Compromise**
The EFM8 MCUs provide no-compromise peripherals that are fully characterized with guaranteed performance over temperature and voltage.

**Ultra Low Power**
EFM8 extends battery life with ultra-low sleep currents down to 50 nA with brown out detection, fast wake up times with less than 2 µs, active currents as low as 150 µA/MHz and Low energy USB module for power consumption reduction of up to 90%.

**Digital Crossbar and Analog Multiplexer**
Silicon Labs' patented crossbar technology enables maximum flexibility and unparalleled ease of development, allowing designers to select any peripherals with no conflicts in pin-out or PCB layout.

**Simplicity Studio™ Software**
Free Simplicity Studio with integrated IDE, free unlimited code size Keil Compiler, demos, libraries and example codes, energy and Capsense Profiler tools, configurators, easily updated support packages, software and documentation, all at your fingertips.
### Package Options

**LASER BEE - PRECISION ANALOG**
- **EFM8LB10F8G**
  - 8 channels, 32 kHz
  - 1.8 to 3.6 V
  - QFN20, QFN32
- **EFM8LB10F16G**
  - 16 channels, 64 kHz
  - 1.8 to 3.6 V
  - QFN20, QFN32
- **EFM8LB16F4G**
  - 4 channels, 64 kHz
  - 1.8 to 3.6 V
  - QFN20, QFN32

**UNIVERSAL BEE - USB**
- **EFM8UB10F4G**
  - 4 channels, 16 MHz
  - 1.8 to 3.6 V
  - QFN20, QFN32
- **EFM8UB10F8G**
  - 8 channels, 32 MHz
  - 1.8 to 3.6 V
  - QFN20, QFN32

**SLEEPY BEE - LOW POWER**
- **EFM8BB10F4G**
  - 4 channels, 16 MHz
  - 1.8 to 3.6 V
  - CSP
- **EFM8BB10F8G**
  - 8 channels, 32 MHz
  - 1.8 to 3.6 V
  - CSP

**BUSY BEE - GENERAL PURPOSE**
- **EFM8BB10F2G**
  - 2 channels, 64 MHz
  - 1.8 to 3.6 V
  - CSP
- **EFM8BB10F3G**
  - 3 channels, 96 MHz
  - 1.8 to 3.6 V
  - CSP

**LASER BEE**
- Precision analog up to 72 MHz
- Flash 16 - 64 KB
- RAM 1 - 4 KB
- HIGHLIGHTS:
  - 72 MHz MCU in 3x3 mm² package – high integration
  - ADC4xDAC2x comparator – state-of-the-art analog
  - ±3 °C temperature sensor – eliminate calibration
  - Configurable Logic – eliminate external glue logic
  - UART or SMBus bootloader

**UNIVERSAL BEE**
- USB up to 48 MHz
- Flash 8 - 64 KB
- RAM 3 - 4 KB
- HIGHLIGHTS:
  - No external crystal or regulator needed for USB
  - Low energy USB - up to 90% power reduction
  - USB charger detect circuit (USB-IC 1.2)
  - 2x UART (3 Mbps), 1x SPI, 1x I2C, 1x COM
  - USB bootstrapper and configurable logic

**SLEEPY BEE**
- Low power up to 25 MHz
- Flash 2 - 64 KB
- RAM 0.5 - 4 KB
- HIGHLIGHTS:
  - Energy friendly – 50 nA sleep mode with BOS
  - Active mode - 150 µA/mHz
  - Fast wake up – < 2 µs
  - Capacitive sense - < 1 µA wake on touch average
  - UART bootstrapper

**BUSY BEE**
- General purpose up to 50 MHz
- Flash 2 - 64 KB
- RAM 0.5 - 4 KB
- HIGHLIGHTS:
  - SAR ADC - 12-bit at 550 kops; 10-bit at 1.125 Mbps
  - 2x low-current comparators with built-in DAC
  - 2x UART (3 Mbps), 1x SPI (12 Mbps), 2x I2C (4 Mbps)
  - “Priority crossbar” - simplifies PCB design
  - UART bootstrapper
Get started with EFM8 today

EFM8 Starter Kits

Silicon Labs offers 8 different starter kits to get started with the EFM8 family of MCUs. All the kits are priced at $29.99.

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Debugger
Integrated debugger provides everything you need for downloading and debugging your code. It can be used as a standalone debugger for other external boards.

Display
A 1.28 inch 128x128 pixel Memory LCD enables interactive applications.

Humidity and Temperature sensor
An integrated Si7021 humidity and temperature sensor to enable data logging applications.

Expansion Header
20-pin expansion header for connection to plug in boards and for future expansion to your design.

Energy Profile
Visualize the energy consumption of your application using the Simplicity Energy Profiler tool.

Easy pin access
Breakout pads at the top and bottom edges of the kit can be soldered to provide easy access to the MCU pins.

Capsense Pads
Capsense pads enable button and slider applications using Capsense Profiler tool.

Joystick
Analog joystick with eight measurable positions for better demo experience.

Energy Profiler
Visualize the energy consumption of your application using the Simplicity Energy Profiler tool.
Simplicity Studio tools make EFM8 development fast and simple.

EFM8 Starter Kits
This $29.99 kit is an excellent starting point to get familiar with EFM8 microcontrollers.
silabs.com/efm8-kits

Capacitive Sense Profiler
This tool simplifies the fine tuning of buttons, sliders, wheels, touch pads and proximity sensors.

Configurator
This tool greatly simplifies EFM8 peripheral initialization by presenting peripherals and peripheral properties in a graphical user interface.

Longevity Commitment
Silicon labs is committed to a minimum 10-year life cycle.

Find your nearest distributor, or buy or sample online. See details at silabs.com/efm8