EFM®32

... the world's most energy friendly microcontrollers

ENERGY micro®

32-bit ARM Cortex-M3

Sub µA Energy Modes

Ultra low active power consumption

Unique autonomous energy saving features

Minimum 4x increased battery lifetime

Energy Metering

001122 kWh

Industrial/Home Automation

80° C
75% Humidity
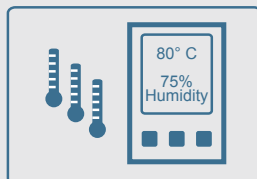
Wireless Alarm/Security

Medical Systems

energymicro.com
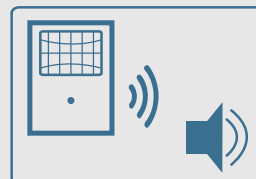
4 times longer battery life with 32-bit EFM32 Gecko microcontrollers

Energy Micro® provides new, innovative, and energy friendly microcontroller technology with the EFM®32 Gecko family. The 32-bit EFM32 MCUs are packed with peripherals built for low energy operation and can increase battery life 4 times compared to other low power 8-, 16-, and 32-bit microcontrollers.

The energy efficient and autonomous peripherals are available in different Energy Modes
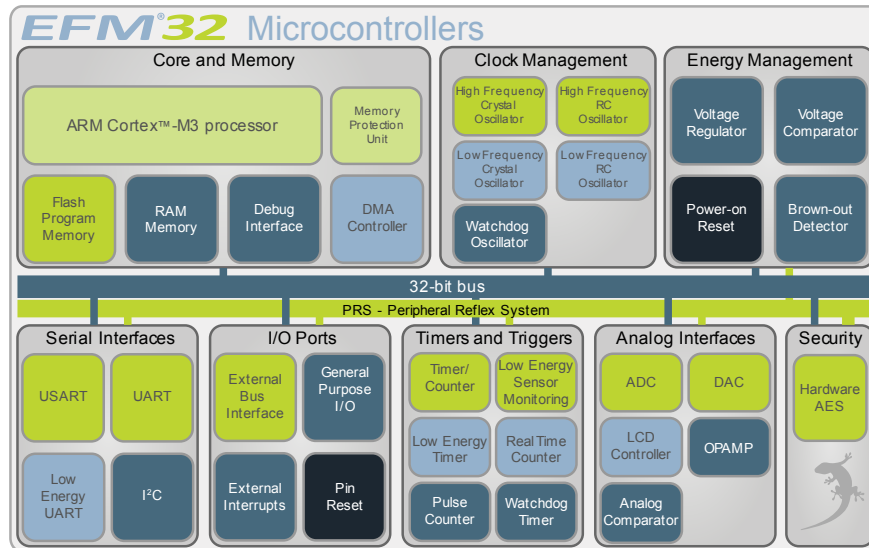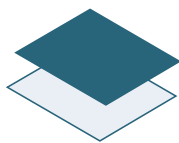

Energy Modes increase battery and application lifetime

Embedded designers get the flexibility to tune their systems energy behavior and complexity with highly efficient Energy Modes and only 2 µs wake-up to Active Mode. Peripherals can be enabled to communicate with each other (PRS) and perform advanced operations without any CPU intervention in the ultra low energy modes.

EFM32 with 3V power supply running real application from Flash memory	EM0 Run Mode	EM1 Sleep Mode	EM2 Deep Sleep Mode	EM3 Stop Mode	EM4 Shutoff Mode
Current consumption	180 µA/MHz	45 µA/MHz	0.9 µA	0.6 µA	20 nA
Wake-up time	-	0	2 µs	2 µs	160 µs
Wake-up events	Any	Any	32 kHz peripherals	Async IRQ, I2C slave, Analog Comparators, Voltage Comparator	Reset
CPU	On	-	-	-	-
High frequency peripherals	Available	Available	-	-	-
Low frequency peripherals	Available	Available	Available	-	-
Asynchronous peripherals	Available	Available	Available	Available	-
Full CPU and SRAM retention	On	On	On	On	-
Power-on Reset/Brown-out Detector	On	On	On	On	On

10 factors why EFM32 MCUs are the world's most energy friendly microcontrollers

1. Very low active power consumption

   180 µA/MHz at 3V while running code from Flash memory

2. Reduced processing time

   High performance 32-bit Cortex-M3 reduces the active periods

3. Very fast wake-up time

   Short 2 µs wake-up promotes use of energy modes

4. Ultra-low standby current

   RAM and CPU retention + POR + BOD + RTC at 0.9 µA

5. Autonomous peripheral operation

   Applications perform advanced tasks without CPU

6. PRS - Peripheral Reflex System

   Predictable and fast signaling without CPU intervention

7. Well architected Energy Modes

   Optimize the application with 5 flexible energy modes

8. Energy efficient peripherals

   LCD controller drives 4x40 segments at only 0.55 µA

   Low Energy UART, full communication using only 32 kHz

   12-bit ADC performing 1 million samples/sec at 350 µA

   Analog Comparator using as little as 100 nA

   HW 128/256-bit AES encryption/decryption in only 54/75 cycles

9. AEM - Advanced Energy Monitoring

   Review your prototype's real-time current consumption

10. energyAware software

   Find, understand, and remove energy bugs easily

EFM32®32

EFM32 Gecko and Tiny Gecko microcontrollers and package options

Every EFM32 MCU offers the Cortex-M3 CPU with a number of peripheral configurations and small footprint packages. Code compatibility and scalability across the whole range of devices make it easy to change a system's features and complexity. All packages are fully Pb-free and RoHS compliant.
EFM32 microcontrollers can also be provided as custom MCUs, please contact us for more information.

Gecko Part No.	Flash (KB)	RAM (KB)	GPIO Pins	LCD	USART+UART	LEUART	I2C	Timer (PWM)	RTC	LETIMER	PCNT	Watchdog	ADC (pins)	DAC (pins)	ACMP (pins)	EBI	AES	Package	Size (mm)	Ordering No.
EFM32G200F16	16	8	24	-	2	1	1	2 (6)	1	1	1	1	1 (4)	1 (1)	2 (5)	-	-	QFN32	6x6	EFM32G200F16-QFN32
EFM32G200F32	32	8	24	-	2	1	1	2 (6)	1	1	1	1	1 (4)	1 (1)	2 (5)	-	-	QFN32	6x6	EFM32G200F32-QFN32
EFM32G200F64	64	16	24	-	2	1	1	2 (6)	1	1	1	1	1 (4)	1 (1)	2 (5)	-	-	QFN32	6x6	EFM32G200F64-QFN32
EFM32G210F128	128	16	24	-	2	1	1	2 (6)	1	1	1	1	1 (4)	1 (1)	2 (5)	-	Y	QFN32	6x6	EFM32G210F128-QFN32
EFM32G230F32	32	8	56	-	3	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	-	Y	QFN64	9x9	EFM32G230F32-QFN64
EFM32G230F64	64	16	56	-	3	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	-	Y	QFN64	9x9	EFM32G230F64-QFN64
EFM32G230F128	128	16	56	-	3	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	-	Y	QFN64	9x9	EFM32G230F128-QFN64
EFM32G280F32	32	8	86	-	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y	Y	QFP100	14x14	EFM32G280F32-QFP100
EFM32G280F64	64	16	86	-	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y	Y	QFP100	14x14	EFM32G280F64-QFP100
EFM32G280F128	128	16	86	-	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y	Y	QFP100	14x14	EFM32G280F128-QFP100
EFM32G290F32	32	8	90	-	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y	Y	BGA112	10x10	EFM32G290F32-BGA112
EFM32G290F64	64	16	90	-	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y	Y	BGA112	10x10	EFM32G290F64-BGA112
EFM32G290F128	128	16	90	-	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y	Y	BGA112	10x10	EFM32G290F128-BGA112
EFM32G840F32	32	8	56	4x24	3	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (8)	-	Y	QFN64	9x9	EFM32G840F32-QFN64
EFM32G840F64	64	16	56	4x24	3	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (8)	-	Y	QFN64	9x9	EFM32G840F64-QFN64
EFM32G840F128	128	16	56	4x24	3	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (8)	-	Y	QFN64	9x9	EFM32G840F128-QFN64
EFM32G880F32	32	8	86	4x40	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y**	Y	QFP100	14x14	EFM32G880F32-QFP100
EFM32G880F64	64	16	86	4x40	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y **	Y	QFP100	14x14	EFM32G880F64-QFP100
EFM32G880F128	128	16	86	4x40	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y**	Y	QFP100	14x14	EFM32G880F128-QFP100
EFM32G890F32	32	8	90	4x40	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y**	Y	BGA112	10x10	EFM32G890F32-BGA112
EFM32G890F64	64	16	90	4x40	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y**	Y	BGA112	10x10	EFM32G890F64-BGA112
EFM32G890F128	128	16	90	4x40	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y**	Y	BGA112	10x10	EFM32G890F128-BGA112

Tiny Gecko Part No.	Flash (KB)	RAM (KB)	GPIO pins	LCD (max)	USART (I2S)	LEUART	I2C	Timer (PWM)	RTC	LETIMER	PCNT	Watchdog	ADC (pins)	DAC (pins)	ACMP (pins)	OPAMP	LESENSE	AES	Package	Size (mm)	Ordering No.
EFM32TG108F4	4	1	17	-	1 (1)	1	1	2 (6)	1	1	1	1	-	-	2 (4)	-	Y*	-	QFN24	5x5	EFM32TG108F4-QFN24
EFM32TG108F8	8	2	17	-	1 (1)	1	1	2 (6)	1	1	1	1	-	-	2 (4)	-	Y*	-	QFN24	5x5	EFM32TG108F8-QFN24
EFM32TG108F16	16	4	17	-	1 (1)	1	1	2 (6)	1	1	1	1	-	-	2 (4)	-	Y*	-	QFN24	5x5	EFM32TG108F16-QFN24
EFM32TG108F32	32	4	17	-	1 (1)	1	1	2 (6)	1	1	1	1	-	-	2 (4)	-	Y*	-	QFN24	5x5	EFM32TG108F32-QFN24
EFM32TG110F4	4	1	17	-	2 (1)	1	1	2 (6)	1	1	1	1	1 (2)	2 (1)	2 (4)	3	Y	Y	QFN24	5x5	EFM32TG110F4-QFN24
EFM32TG110F8	8	2	17	-	2 (1)	1	1	2 (6)	1	1	1	1	1 (2)	2 (1)	2 (4)	3	Y	Y	QFN24	5x5	EFM32TG110F8-QFN24
EFM32TG110F16	16	4	17	-	2 (1)	1	1	2 (6)	1	1	1	1	1 (2)	2 (1)	2 (4)	3	Y	Y	QFN24	5x5	EFM32TG110F16-QFN24
EFM32TG110F32	32	4	17	-	2 (1)	1	1	2 (6)	1	1	1	1	1 (2)	2 (1)	2 (4)	3	Y	Y	QFN24	5x5	EFM32TG110F32-QFN24
EFM32TG210F8	8	2	24	-	2 (1)	1	1	2 (6)	1	1	1	1	1 (4)	2 (1)	2 (5)	3	Y	Y	QFN32	6x6	EFM32TG200F8-QFN32
EFM32TG210F16	16	4	24	-	2 (1)	1	1	2 (6)	1	1	1	1	1 (4)	2 (1)	2 (5)	3	Y	Y	QFN32	6x6	EFM32TG200F16-QFN32
EFM32TG210F32	32	4	24	-	2 (1)	1	1	2 (6)	1	1	1	1	1 (4)	2 (1)	2 (5)	3	Y	Y	QFN32	6x6	EFM32TG200F32-QFN32
EFM32TG230F8	8	2	56	-	2 (1)	1	1	2 (6)	1	1	1	1	1 (8)	2 (2)	2 (16)	3	Y	Y	QFN64	9x9	EFM32TG230F8-QFN64
EFM32TG230F16	16	4	56	-	2 (1)	1	1	2 (6)	1	1	1	1	1 (8)	2 (2)	2 (16)	3	Y	Y	QFN64	9x9	EFM32TG230F16-QFN64
EFM32TG230F32	32	4	56	-	2 (1)	1	1	2 (6)	1	1	1	1	1 (8)	2 (2)	2 (16)	3	Y	Y	QFN64	9x9	EFM32TG230F32-QFN64
EFM32TG840F8	8	2	56	8x20	2 (1)	1	1	2 (6)	1	1	1	1	1 (8)	2 (2)	2 (8)	3	Y	Y	QFN64	9x9	EFM32TG840F8-QFN64
EFM32TG840F16	16	4	56	8x20	2 (1)	1	1	2 (6)	1	1	1	1	1 (8)	2 (2)	2 (8)	3	Y	Y	QFN64	9x9	EFM32TG840F16-QFN64
EFM32TG840F32	32	4	56	8x20	2 (1)	1	1	2 (6)	1	1	1	1	1 (8)	2 (2)	2 (8)	3	Y	Y	QFN64	9x9	EFM32TG840F32-QFN64

* Reduced Functionality
** EBI (External Bus Interface) exclusion with LCD controller functionality

Operation range: 1.8 to 3.8 volts, -40° to 85°C
On-chip memory: Up to 128 KB Flash and 16 KB RAM
General Purpose IO: Up to 90 pins with 20 mA drive strength

QFN24
5 x 5 mm
0.65 mm pitch

QFN32
6 x 6 mm
0.65 mm pitch

QFN64
9 x 9 mm
0.5 mm pitch

BGA112
10 x 10 mm
0.8 mm pitch

QFP100
14 x 14 mm
0.5 mm pitch

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Energy efficient development

EFM32 MCUs are supported by high-end, low-cost development kits and evaluation tools. The kits have an integrated J-Link debugger for software development and the software library support all major tool chains. The Advanced Energy Monitor (AEM) system and the energyAware Profiler and Designer software enables simple graphical visualization and optimization of your application's energy consumption and code.

EFM32 Gecko Development Kit

The kit includes exchangeable MCU and large prototyping boards, a 320x240 LCD screen, buttons, serial interfaces, accelerometer, J-Link debugger, and the real-time AEM system. The kit costs $299.

• EFM32-G2xx-DK   • EFM32-G8xx-DK includes LCD support
www.energymicro.com/tools

EFM32 Starter Kit

The kit includes a capacitive touch slider and button, 3V battery operation, J-Link debugger, and the AEM system outputs data to the energyAware Profiler. The starter kit costs $69.

• EFM32-G8xx-STK includes LCD support
www.energymicro.com/tools

energyAware Software and Documentation

The free energyAware software library contains documentation and software examples for the development and starter kits. Perform real-time code profiling and debugging - click on the current graph and instantly see the applications energy consumption.
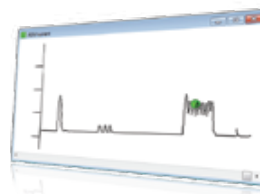
www.energymicro.com/downloads   www.energymicro.com/software

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• Rowley Associates   • SMX RTOS   • SEGGER   • IAR Systems
• ELNEC Programmers   • RK-System Programmers

Cortex
Intelligent Processors by ARM

The EFM32 Gecko microcontrollers are supported by a large community of suppliers providing IDE and Compilers, Debug systems, Development kits, and Real-Time Operating Systems.

Worldwide Support and Sales channels

Energy Micro was founded in 2007 and partners with industry leaders like ARM, UTAC, and TSMC to provide the world's most energy friendly microcontrollers. A global network of sales partners ensure that customers can rely on local technical and commercial support.

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