

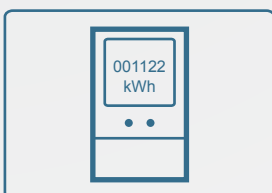
# EFM<sup>®</sup>32

... the world's most energy friendly microcontrollers

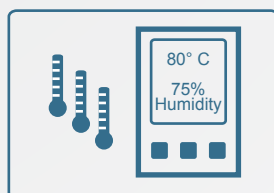


## 4x longer battery lifetime with EFM32 microcontrollers

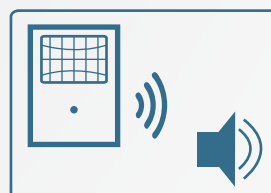
Energy Metering



Industrial/Home Automation



Wireless Alarm/Security



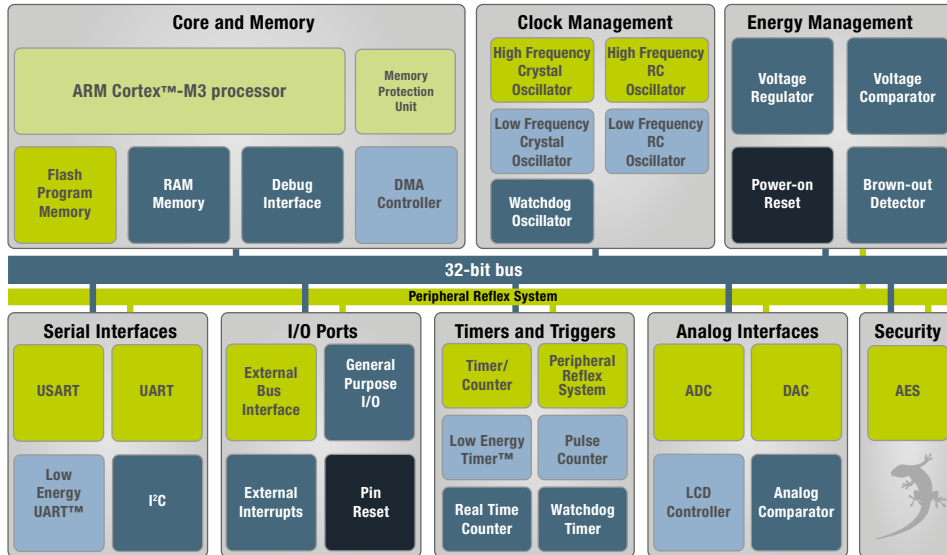
Medical Systems



## 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 microcontroller family. The 32-bit EFM32 is 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 and perform advanced operations without any CPU intervention in the ultra low energy modes.



<i>EFM32 running real application from Flash memory with 3V power supply</i>	<b>EM0 Run Mode</b>	<b>EM1 Sleep Mode</b>	<b>EM2 Deep Sleep Mode</b>	<b>EM3 Stop Mode</b>	<b>EM4 Shutoff Mode</b>
Current consumption	180 µA/MHz	45 µA/MHz	0.9 µA	0.6 µA	20 nA
Wake-up time	0	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	On	On			
Low frequency peripherals	On	On	On		
Full CPU and SRAM retention	On	On	On	On	
Power-on Reset/Brown-out Detector	On	On	On	On	On

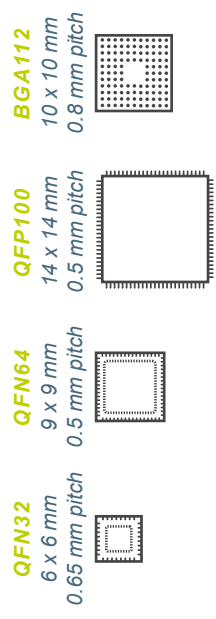
## Highly integrated and ultra low power features

- 32-bit ARM Cortex-M3 running up to 32 MHz
  - 1.25 DMIPS/MHz
  - Superior Math Capability
  - Memory Protection Unit (MPU)
- Single 1.8 to 3.8 volt power supply
- -40° to 85°C operation range
- Up to 128 KB Flash and 16 KB RAM memory
- Up to 90 GPIO with 20 mA drive strength
- 16 External Interrupts
- External Bus Interface (EBI)
- Direct memory access Controller (DMA)
- Peripheral Reflex System for autonomous operation
- Security AES 128/256-bit encryption/decryption
- Integrated high and low frequency oscillators
- USARTs with UART and SPI modes up to 16 Mbit/s
- Low Energy UART with 100 nA receive mode
- 16-bit Timer/Counters with Compare/Capture
- Low Energy TIMER with optional pulse outputs
- Flexible 24-bit Real Time Counter
- Pulse Counter
- Configurable LCD Controller driving up to 4x40 segments
- 12-bit ADC, 1 Msamples/s, 8 channels
- 12-bit DAC, 500 ksamples/s, 2 channels
- Analog Comparators with 8 input mux and capacitive sensing capability
- On-chip Power-on Reset and Brown-out Detector

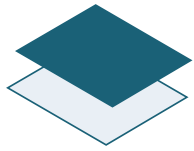
## EFM32 Gecko microcontroller family and package options

Part No.	Flash	RAM	GPIO (pins)	LCD	USART +UART	LEUART	I2C	Timer (PWM)	RTC	LETIMER	PCNT	WDOG	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	85	-	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	85	-	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	85	-	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	85	4x40	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y (*1)	Y	QFP100	14x14	EFM32G880F32-QFP100
EFM32G880F64	64	16	85	4x40	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y (*1)	Y	QFP100	14x14	EFM32G880F64-QFP100
EFM32G880F128	128	16	85	4x40	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y (*1)	Y	QFP100	14x14	EFM32G880F128-QFP100
EFM32G90F32	32	8	90	4x40	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y (*1)	Y	BGA112	10x10	EFM32G90F32-BGA112
EFM32G90F64	64	16	90	4x40	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y (*1)	Y	BGA112	10x10	EFM32G90F64-BGA112
EFM32G90F128	128	16	90	4x40	3+1	2	1	3 (9)	1	1	3	1	1 (8)	2 (2)	2 (16)	Y (*1)	Y	BGA112	10x10	EFM32G90F128-BGA112

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. EFM32 can also be provided as Custom microcontrollers. All packages are fully Pb-free and RoHS compliant. \*1: EBI exclusion with LCD controller functionality



**BGA112**  
 10 x 10 mm  
 0.8 mm pitch



## EFM32 Development Tools

EFM32 microcontrollers are supported by a complete range of high-end, low-cost development kits and evaluation tools. Tools come with integrated emulator for software development and debugging, and a software library supported by major tool chains such as IAR Embedded Workbench<sup>®</sup>, KEIL  $\mu$ Vision<sup>®</sup> and GNU GCC. EFM32 tools are designed to make prototyping and product development a breeze.

- Advanced Energy Monitoring system
  - Real-time, accurate energy and power profiling
- On-board USB based programming and debugging
- User interface with 320\*240 RGB LCD display and LEDs
  - Joystick, switches, and potentiometer
- Highly modular design with plug-in MCU boards
- Large I/O capability
  - EXP32 expansion port, 2x RS232, IrDA, Memory Card
  - EXP32 prototyping module
- 3-axis acceleration sensor and light sensor
- Board Support Package and Device Support Library
- Development support for major tool chains



*EFM32 Gecko Development Kit  
with MCU plug-in and prototype boards  
and Advanced Energy Monitoring*

### Ordering Information

*EFM32 Gecko Development Kit  
EFM32 Gecko Development Kit (with LCD support)*

*EFM32-G2xx-DK  
EFM32-G8xx-DK*

## The world's most licensed 32-bit architecture



ARM's innovations in high performance, low power technology are supported by the industry's largest network of Partners – the ARM Connected Community. Leading silicon, systems, design support, software, and training organizations provide a complete solution for products based on the ARM Architecture.

*Lowest Energy ARM Cortex-M3 MCU  
Energy Micro's EFM32 microcontroller family*

*Software and Hardware Support  
EFM32 development kits and board support package*

### Compilers and Debuggers

- IAR Systems<sup>®</sup>
- Segger
- GNU GCC for ARM
- KEIL<sup>™</sup>
- Hitex

**EFM<sup>®</sup>32 ... the world's most energy friendly microcontrollers**