

EFR32BG22L Wireless Gecko SoC Family

Data Short



The EFR32BG22L Wireless Gecko family of SoCs is part of the Wireless Gecko portfolio. EFR32BG22L Wireless Gecko SoCs are ideal for enabling energy-friendly Bluetooth networking for IoT devices.

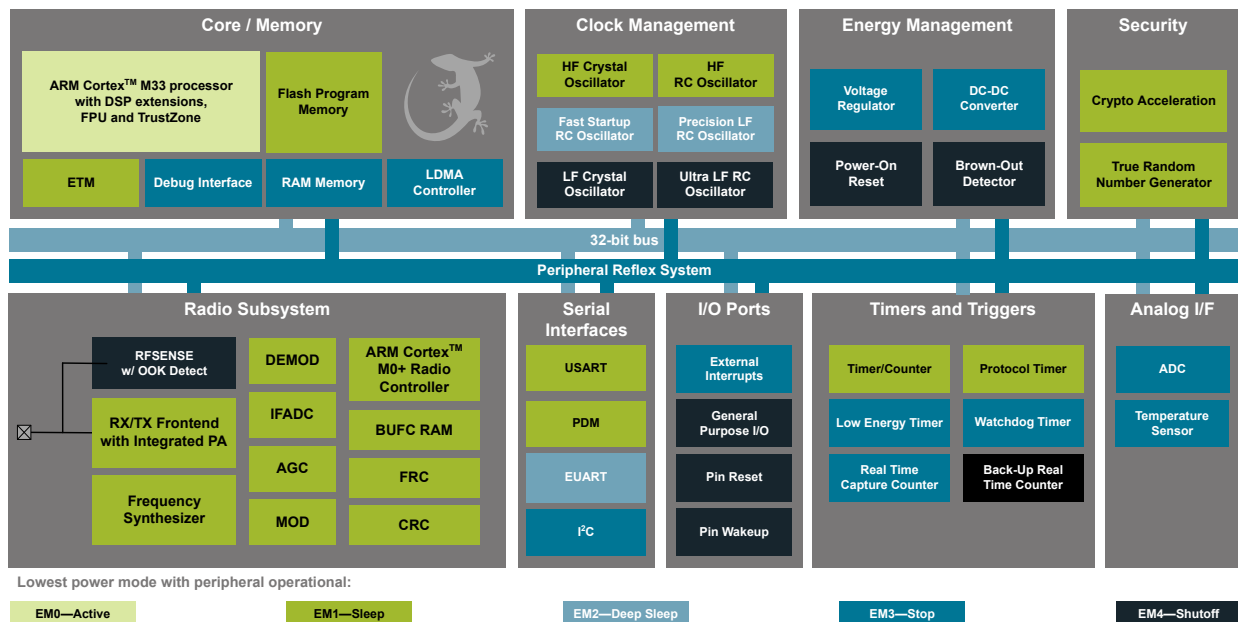
The single-die solution combines a 38.4 MHz Cortex-M33 with a high performance 2.4 GHz radio to provide an industry-leading, energy efficient wireless, SoC for IoT connected applications.

Wireless Gecko applications include:

- Asset Tags and Beacons
- Remote Controls
- Portable Medical
- Bluetooth Mesh Low Power Nodes
- Sports, Fitness, and Wellness devices
- Rearview Mirrors
- Garage Door Openers

KEY FEATURES

- 32-bit ARM® Cortex®-M33 core with 38.4 MHz maximum operating frequency
- Up to 352 kB of flash and 24 kB of RAM
- Energy-efficient radio core with low active and sleep currents
- Integrated PA with up to 6 dBm (2.4 GHz) TX power
- Secure Boot with Root of Trust and Secure Loader (RTSL)



1. Feature List

The EFR32BG22L highlighted features are listed below.

- **Low Power Wireless System-on-Chip**
 - High Performance 32-bit 38.4 MHz ARM Cortex®-M33 with DSP instruction and floating-point unit for efficient signal processing
 - Up to 352 kB flash program memory
 - Up to 24 kB RAM data memory
 - 2.4 GHz radio operation
- **Radio Performance**
 - -106.7 dBm sensitivity @ 125 kbps GFSK
 - -98.9 dBm sensitivity @ 1 Mbit/s GFSK
 - -96.2 dBm sensitivity @ 2 Mbit/s GFSK
 - TX power up to 6 dBm
 - 2.5 mA radio receive current
 - 3.4 mA radio transmit current @ 0 dBm output power
 - 7.5 mA radio transmit current @ 6 dBm output power
- **Low System Energy Consumption**
 - 3.6 mA RX current (1 Mbps GFSK)
 - 4.1 mA TX current @ 0 dBm output power
 - 8.2 mA TX current @ 6 dBm output power
 - 26 μ A/MHz in Active Mode (EM0) at 38.4 MHz
 - 1.40 μ A EM2 DeepSleep current (32 kB RAM retention and RTC running from LFXO)
 - 1.75 μ A EM2 DeepSleep current (32 kB RAM retention and RTC running from Precision LFRCO)
 - 0.17 μ A EM4 current
- **Supported Modulation Format**
 - 2 (G)FSK with fully configurable shaping
 - OQPSK DSSS
 - (G)MSK
- **Protocol Support**
 - Bluetooth Low Energy
 - Proprietary
- **Wide Selection of MCU Peripherals**
 - Analog to Digital Converter (ADC)
 - 12-bit @ 1 Msps
 - 16-bit @ 76.9 kbps
 - Up to 18 General Purpose I/O pins with output state retention and asynchronous interrupts
 - 8 Channel DMA Controller
 - 12 Channel Peripheral Reflex System (PRS)
 - 4 \times 16-bit Timer/Counter with 3 Compare/Capture/PWM channels
 - 1 \times 32-bit Timer/Counter with 3 Compare/Capture/PWM channels
 - 32-bit Real Time Counter
 - 24-bit Low Energy Timer for waveform generation
 - 1 \times Watchdog Timer
 - 2 \times Universal Synchronous/Asynchronous Receiver/Transmitter (UART/SPI/SmartCard (ISO 7816)/IrDA/I²S)
 - 1 \times Enhanced Universal Asynchronous Receiver/Transmitter (EUSART)
 - 2 \times I²C interface with SMBus support
 - Digital microphone interface (PDM)
 - Precision Low-Frequency RC Oscillator to replace 32 kHz sleep crystal
 - RFSENSE with selective OOK mode
 - Die temperature sensor with +/-1.5 degree C accuracy after single-point calibration
- **Wide Operating Range**
 - 1.71 to 3.8 V single power supply
 - -40 to 85 $^{\circ}$ C
- **Security Features**
 - Secure Boot with Root of Trust and Secure Loader (RTSL)
 - Hardware Cryptographic Acceleration for AES128/256, SHA-1, SHA-2 (up to 256-bit), ECC (up to 256-bit), ECDSA, and ECDH
 - True Random Number Generator (TRNG) compliant with NIST SP800-90 and AIS-31
 - ARM® TrustZone®
 - Secure Debug with lock/unlock
- **Packages**
 - QFN32 4 \times 4 \times 0.85 mm

2. Ordering Information

Table 2.1. Ordering Information

Ordering Code	Protocol Stack	Max TX Power	Max CPU Speed	LFRCO	Flash (kB)	RAM (kB)	GPIO	Package	Temp Range
EFR32BG22L122F352GM32-C	<ul style="list-style-type: none">Bluetooth 5.xProprietary	6 dBm	38.4 MHz	Precision	352	24	18	QFN32	-40 to 85 °C

Note:

- Bluetooth 5.x: As the Bluetooth standard evolves, Silicon Labs is regularly adding new features. For more information on supported Bluetooth capabilities, visit <https://www.silabs.com/bluetooth-hardware>.

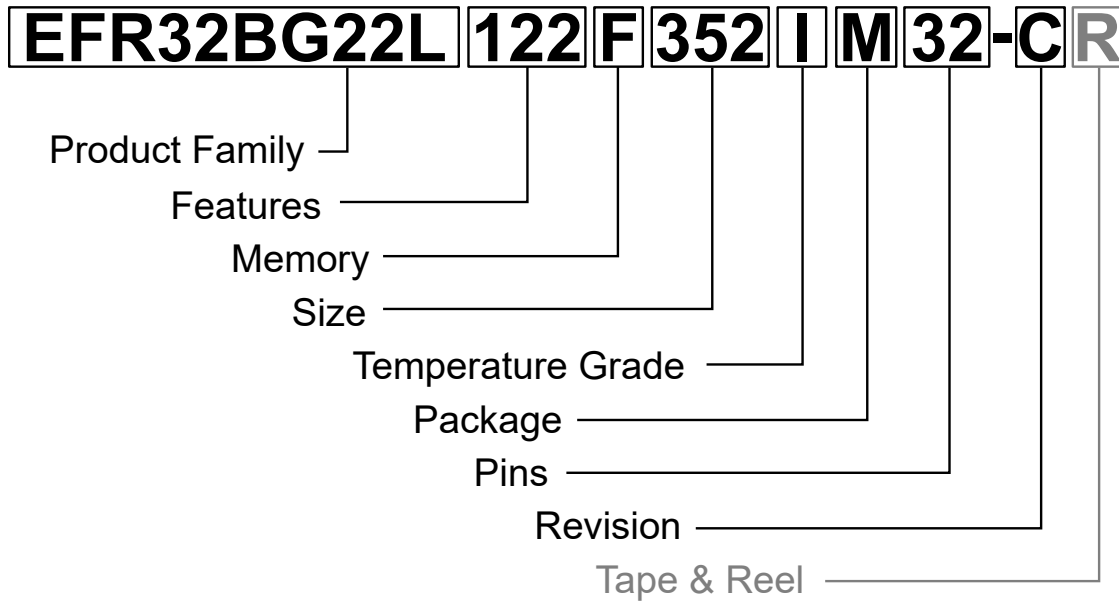


Figure 2.1. Ordering Code Key

Field	Options
Product Family	<ul style="list-style-type: none"> • EFR32BG22L: Blue Gecko 22L Family
Features [f1][f2][f3]	<ul style="list-style-type: none"> • f1 <ul style="list-style-type: none"> • 1: MCU Frequency of 38.4 MHz • 2: MCU Frequency of 76.8 MHz • f2 <ul style="list-style-type: none"> • 1: 0 dBm output power • 2: 6 dBm output power • f3 <ul style="list-style-type: none"> • 1: No Direction finding, without Precision LFRCO • 2: No Direction finding, with Precision LFRCO • 3: Direction finding, without Precision LFRCO • 4: Direction finding, with Precision LFRCO
Memory	<ul style="list-style-type: none"> • F: Flash
Size	<ul style="list-style-type: none"> • Memory Size in kBytes
Temperature Grade	<ul style="list-style-type: none"> • G: -40 to +85 °C • I: -40 to +125 °C
Package	<ul style="list-style-type: none"> • M: QFN
Pins	<ul style="list-style-type: none"> • Number of Package Pins
Revision	<ul style="list-style-type: none"> • C: Revision C
Tape & Reel	<ul style="list-style-type: none"> • R: Tape & Reel (optional)

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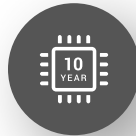
One-click access to MCU and wireless tools, documentation, software, source code libraries & more. Available for Windows, Mac and Linux!



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