EFR32BG24L Wireless Gecko SoC Family Data Short

The EFR32BG24L Wireless SoCs are ideal for wireless connectivity using Bluetooth Low Energy and Bluetooth mesh.

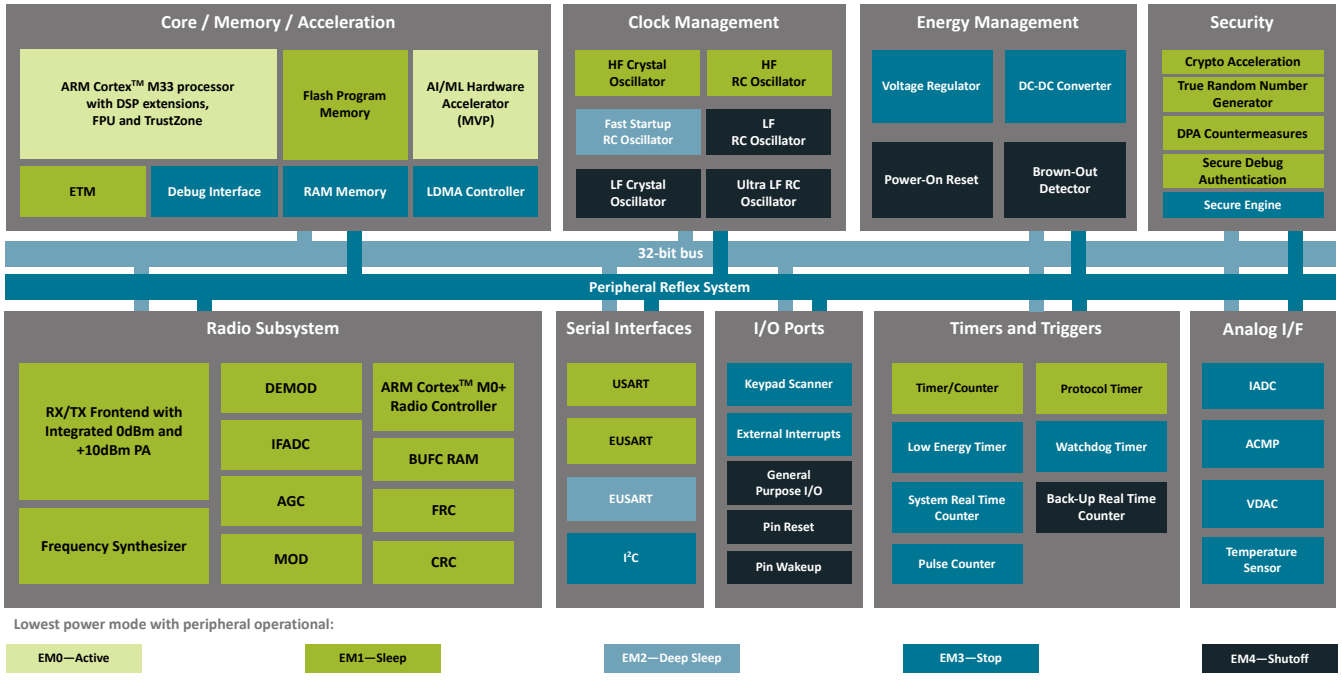
With key features like high performance 2.4 GHz RF, low current consumption, an AI/ML hardware accelerator and Secure Vault, IoT device makers can create smart, robust, and energy-efficient products that are secure from remote and local cyber-attacks. A Cortex®-M33 running up to 78 MHz and up to 768 kB of flash and 96 kB of RAM provides resources for demanding applications while leaving room for future growth.

Target applications include:

- Smart Home - Gateways and hubs, sensors, switches, door locks, smart plugs
- Lighting - LED bulbs, luminaires
- Portable Medical Devices - Blood glucose meters, pulse oximeters
- AI/ML - Predictive maintenance, anomaly detection

KEY FEATURES

- 32-bit ARM® Cortex®-M33 core with 78 MHz maximum operating frequency
- Up to 768 kB of flash and 96 kB of RAM
- High performance radio with up to +10 dBm output power
- Energy efficient design with low active and sleep currents
- Secure Vault™
- AI/ML Hardware Accelerator
- Channel sounding



1. Feature List

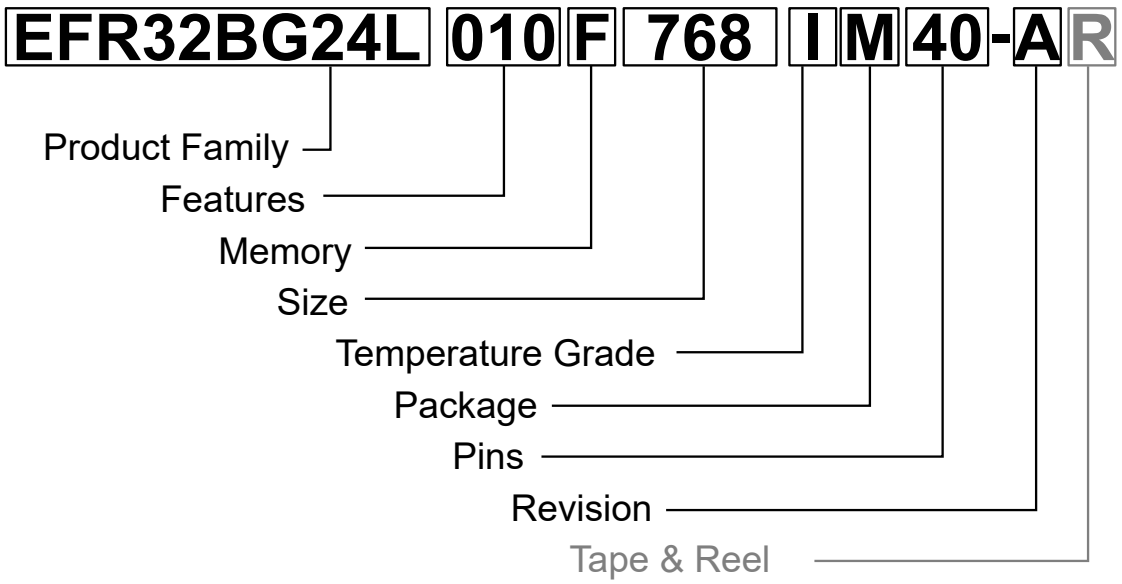
The EFR32BG24L highlighted features are listed below.

- **Low Power Wireless System-on-Chip**
  - High Performance 32-bit 78 MHz ARM Cortex®-M33 with DSP instruction and floating-point unit for efficient signal processing
  - Up to 768 kB flash program memory
  - Up to 96 kB RAM data memory
  - 2.4 GHz radio operation
  - Matrix Vector Processor for AI/ML acceleration
- **Radio Performance**
  - -105.7 dBm sensitivity @ 125 kbps GFSK
  - -97.6 dBm sensitivity @ 1 Mbps GFSK
  - -94.8 dBm sensitivity @ 2 Mbps GFSK
  - TX power up to 10 dBm
- **Low System Energy Consumption**
  - 4.4 mA RX current (1 Mbps GFSK)
  - 5 mA TX current @ 0 dBm output power
  - 19.1 mA TX current @ 10 dBm output power
  - 33.4 µA/MHz in Active Mode (EM0) at 39.0 MHz
  - 1.3 µA EM2 DeepSleep current (16 kB RAM retention and RTC running from LFRCO)
- **Supported Modulation Format**
  - 2 (G)FSK with fully configurable shaping
  - OQPSK DSSS
  - (G)MSK
- **Protocol Support**
  - Bluetooth Low Energy
  - Bluetooth Mesh
  - Proprietary 2.4 GHz
  - Direction finding using Angle-of-Arrival (AoA) and Angle-of-Departure (AoD)
  - Channel sounding
    - 40 MHz crystal required
    - Maximum TX power for Channel Sounding is 10 dBm for all part numbers
- **Secure Vault**
  - Hardware Cryptographic Acceleration for AES128/192/256, ChaCha20-Poly1305, SHA-1, SHA-2/256/384/512, ECDSA +ECDH(P-192, P-256, P-384, P-521), Ed25519 and Curve25519, J-PAKE, PBKDF2
  - True Random Number Generator (TRNG)
  - ARM® TrustZone®
  - Secure Boot (Root of Trust Secure Loader)
  - Secure Debug Unlock
  - DPA Countermeasures
  - Secure Attestation
- **Wide Selection of MCU Peripherals**
  - Analog to Digital Converter (IADC)
    - 12-bit @ 1 Msps
    - 16-bit @ 76.9 ksps
  - 2 × Analog Comparator (ACMP)
  - 2 × Digital to Analog Converter (VDAC)
  - Up to 26 General Purpose I/O pins with output state retention and asynchronous interrupts
  - 8 Channel DMA Controller (LDMA)
  - 16 Asynchronous Channel, 4 Synchronous Channel Peripheral Reflex System (PRS)
  - 3 × 16-bit Timer/Counter with 3 Compare/Capture/PWM channels (TIMER2/3/4)
  - 2 × 32-bit Timer/Counter with 3 Compare/Capture/PWM channels (TIMER0/1)
  - 2 x 32-bit Real Time Counter (SYSRTC/BURTC)
  - 24-bit Low Energy Timer for waveform generation (LETIMER)
  - 16-bit Pulse Counter with asynchronous operation (PCNT)
  - 2 × Watchdog Timer (WDOG)
  - 1 × Universal Synchronous/Asynchronous Receiver/Transmitter (USART), supporting UART/SPI/SmartCard (ISO 7816)/IrDA/I^2S
  - 2 × Enhanced Universal Synchronous/Asynchronous Receiver/Transmitter (EUSART) supporting UART/SPI/DALI/IrDA
  - 2 × I^2C interface with SMBus support
  - Low-Frequency RC Oscillator with precision mode to replace 32 kHz sleep crystal (LFRCO)
  - Keypad scanner supporting up to 6x8 matrix (KEYSCAN)
  - Die temperature sensor with +/-1.5 °C accuracy after single-point calibration
- **Wide Operating Range**
  - 1.71 to 3.8 V single power supply
  - -40 to 125 °C
- **Packages**
  - **QFN40** 5 × 5 × 0.85 mm

2. Ordering Information

Table 2.1. Ordering Information

Ordering Code	Max TX Power	Flash (kB)	RAM (kB)	Secure Vault	Multi-vector Processor	GPIO	Package / Pinout
EFR32BG24L010F768IM40-B	10 dBm	768	96	Mid	No	26	QFN40 / Standard
EFR32BG24L210F768IM40-B	10 dBm	768	96	Mid	Yes	26	QFN40 / Standard



Field	Options
Product Family	• **EFR32BG24L**: Blue Gecko 24L Family

Features [f1][f2][f3]	• f1
	  • **0**: No feature enabled
	  • **1**: IADC High-Speed / High-Accuracy Available
	  • **2**: Matrix Vector Processor (MVP) Available
	  • **3**: IADC High-Speed / High-Accuracy and Matrix Vector Processor (MVP) Available
	• f2
	  • **1**: 10 dBm PA Transmit Power
	• f3
	  • **0**: No feature enabled
	  • **1**: High Quality HFCLKOUT Pin Available

Memory	• **F**: Flash
Size	• **Memory Size** in kBytes
Temperature Grade	• **G**: -40 to +85 °C • **I**: -40 to +125 °C
Package	• **M**: QFN
Pins	• **Number of Package Pins**
Revision	• **A**: Revision A
Tape & Reel	• **R**: Tape & Reel (optional)

Figure 2.1. Ordering Code Key

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