



EFR32BG22 Wireless Gecko SoC Family

Data Sheet



The EFR32BG22 Wireless Gecko family of SoCs is part of the Wireless Gecko portfolio. EFR32BG22 Wireless Gecko SoCs are ideal for enabling energy-friendly Bluetooth 5.2 networking for IoT devices.

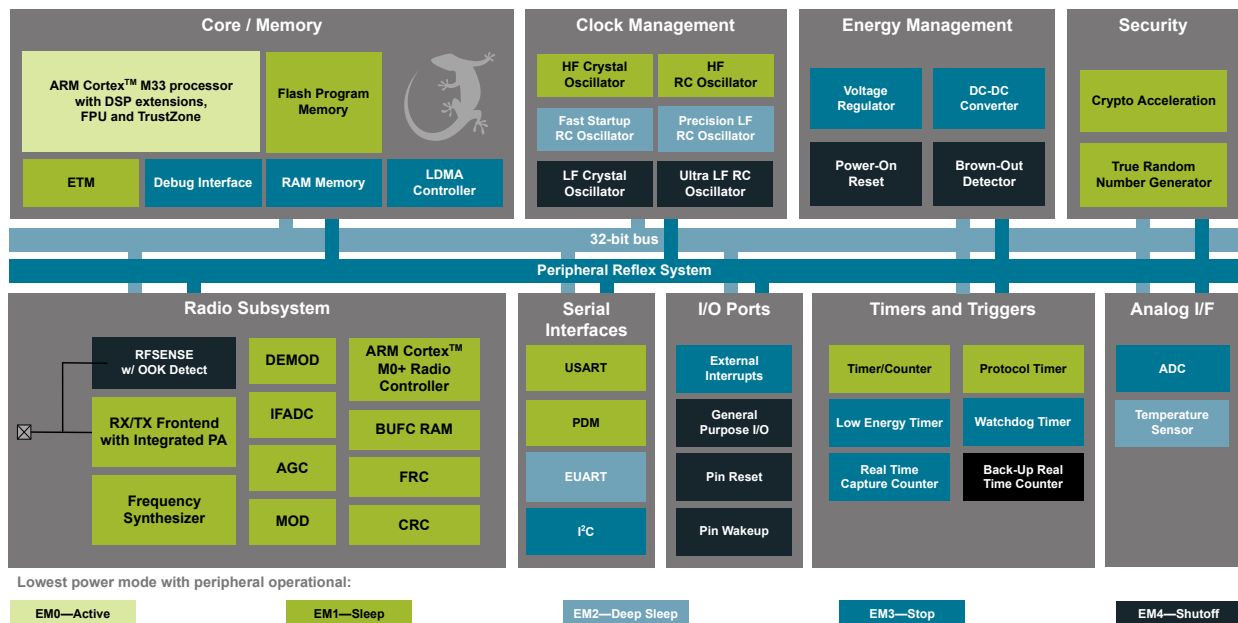
The single-die solution combines a 76.8 MHz Cortex-M33, with a high performance 2.4 GHz radio to provide an industry-leading, energy efficient wireless SoC for IoT connected applications.

Wireless Gecko applications include:

- Asset Tags and Beacons
- Consumer Electronics Remote Controls
- Portable Medical
- Bluetooth Mesh Low Power Nodes
- Sports, Fitness, and Wellness devices
- Connected Home
- Building Automation and Security

KEY FEATURES

- 32-bit ARM® Cortex®-M33 core with 76.8 MHz maximum operating frequency
- Up to 512 kB of flash and 32 kB of RAM
- Energy-efficient radio core with low active and sleep currents
- Bluetooth 5.2 Direction Finding
- 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 EFR32BG22 highlighted features are listed below.

- **Low Power Wireless System-on-Chip**
 - High Performance 32-bit 76.8 MHz ARM Cortex®-M33 with DSP instruction and floating-point unit for efficient signal processing
 - Up to 512 kB flash program memory
 - Up to 32 kB RAM data memory
 - 2.4 GHz radio operation
- **Radio Performance**
 - -98.9 dBm sensitivity @ 1 Mbit/s GFSK
 - -96.2 dBm sensitivity @ 2 Mbit/s GFSK
 - -106.7 dBm sensitivity @ 125 kbps GFSK
 - TX power up to 6 dBm
 - 2.6 mA radio receive current
 - 3.5 mA radio transmit current @ 0 dBm output power
 - 7.8 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
 - 27 µA/MHz in Active Mode (EM0) at 76.8 MHz
 - 26 µA/MHz in Active Mode (EM0) at 38.4 MHz
 - 1.40 µA EM2 DeepSleep current (32 kB RAM retention and RTC running from LFXO)
 - 1.75 µA EM2 DeepSleep current (32 kB RAM retention and RTC running from Precision LFRCO)
 - 1.05 µA EM3 DeepSleep current (8 kB RAM retention and RTC running from ULFRCO)
- **Supported Modulation Format**
 - 2 (G)FSK with fully configurable shaping
 - OQPSK DSSS
 - (G)MSK
- **Protocol Support**
 - Bluetooth Low Energy (Bluetooth 5.2)
 - Direction finding using Angle-of-Arrival (AoA) and Angle-of-Departure (AoD)
 - Proprietary
- **Wide selection of MCU peripherals**
 - 12-bit 1 Msps SAR Analog to Digital Converter (ADC)
 - Up to 26 General Purpose I/O pins with output state retention and asynchronous interrupts
 - 8 Channel DMA Controller
 - 12 Channel Peripheral Reflex System (PRS)
 - 4 × 16-bit Timer/Counter with 3 Compare/Capture/PWM channels
 - 1 × 32-bit Timer/Counter with 3 Compare/Capture/PWM channels
 - 32-bit Real Time Counter
 - 24-bit Low Energy Timer for waveform generation
 - 1 × Watchdog Timer
 - 2 × Universal Synchronous/Asynchronous Receiver/Transmitter (UART/SPI/SmartCard (ISO 7816)/IrDA/I²S)
 - 1 × Enhanced Universal Asynchronous Receiver/Transmitter (EUART)
 - 2 × I²C interface with SMBus support
 - Digital microphone interface (PDM)
 - Precision Low-Frequency RC Oscillator enabling single-crystal operation
 - RFSense with selective OOK mode
 - Die temperature sensor with +/-2 degree C accuracy across temperature range
- **Wide Operating Range**
 - 1.71 V to 3.8 V single power supply
 - -40 °C to 125 °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**
 - **QFN40** 5 mm × 5 mm × 0.85 mm
 - **QFN32** 4 mm × 4 mm × 0.85 mm
 - **TQFN32** 4 mm × 4 mm × 0.30 mm