EFR32MG22E Wireless Gecko SoC Family Data Short

The EFR32MG22E Wireless Gecko multiprotocol family of SoCs is part of the Wireless Gecko portfolio. EFR32MG22E Wireless Gecko SoCs are ideal for enabling energy-friendly multiprotocol networking for IoT devices that require fast startup.

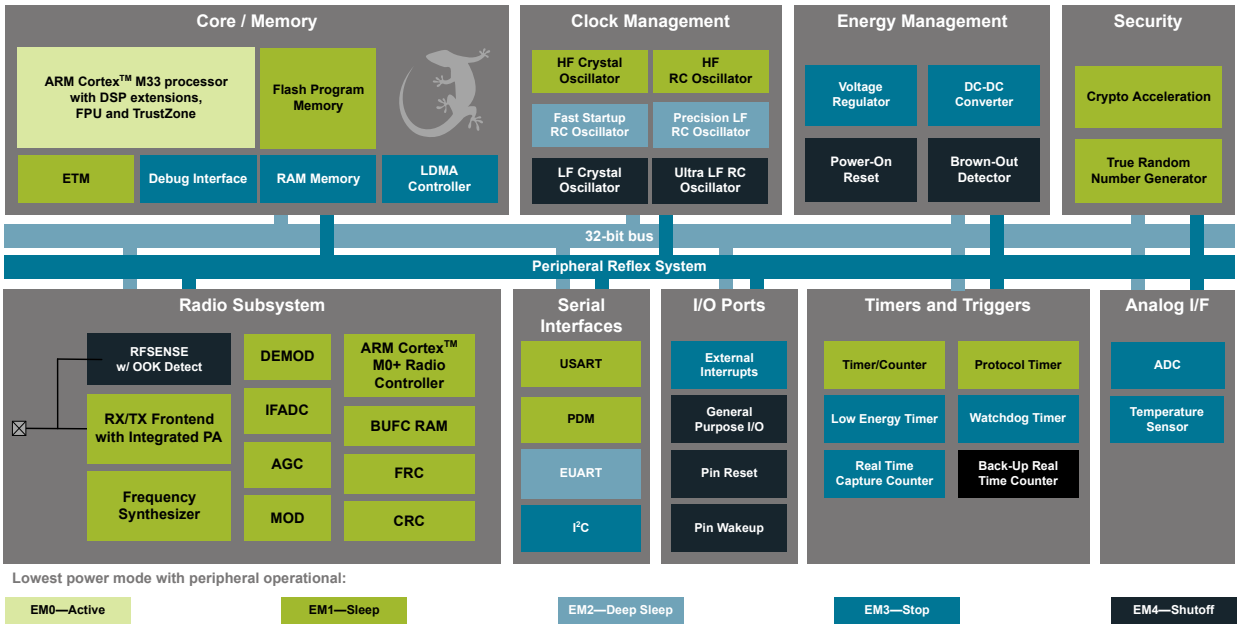
The single-die solution combines a 76.8 MHz MHz ARM Cortex-M33 with a high performance 2.4 GHz radio to provide an industry-leading, energy efficient, wireless SoC for IoT connected energy constrained applications.

Wireless Gecko applications include:

- Zigbee Green Power
- Zigbee End Devices Home Automation
- Lighting Controls
- Building Controls
- Industrial Sensors
- Energy Harvest Smart Building Sensors
- Energy Harvest Kinetic Switches
- Energy Harvest Condition Monitoring

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
- 12-channel Peripheral Reflex System enabling autonomous interaction of MCU peripherals
- Integrated PA with up to 6 dBm (2.4 GHz) TX power
- Fast cold start boot time and wake-up from EM4



1. Feature List

The EFR32MG22E highlighted features are listed below.

- **Low Power Wireless System-on-Chip**
  - High Performance 32-bit 76.8 MHz 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**
  - -102.3 dBm sensitivity @ 250 kbps O-QPSK DSSS
  - -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**
  - 3.9 mA RX current (250 kbps O-QPSK DSSS)
  - 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
  - 1.40 µA EM2 DeepSleep current (32 kB RAM retention and RTC running from LFRCO)
  - 0.17 µA EM4 current
- **Supported Modulation Format**
  - OQPSK DSSS
  - 2 (G)FSK with fully configurable shaping
  - (G)MSK
- **Protocol Support**
  - Zigbee PRO / Green Power
  - Bluetooth Low Energy (Bluetooth 5)
  - Direction finding using Angle-of-Arrival (AoA) and Angle-of-Departure (AoD)
  - Proprietary
- **Quality**
  - AEC-Q100 Qualification including AEC-Q006
- **Fast boot and wake-up**
  - Fast cold start boot time
  - Fast wake-up from EM4
- **Wide selection of MCU peripherals**
  - Analog to Digital Converter (ADC)
    - 12-bit @ 1 Msps
    - 16-bit @ 76.9 ksps
  - 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/I^2S)
  - 1 × Enhanced Universal Asynchronous Receiver/Transmitter (EUART)
  - 2 × I^2C 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 V to 3.8 V single power supply
  - -40 °C to 125 °C
- **Security Features**
  - 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®
- **Packages**
  - **QFN40** 5 mm × 5 mm × 0.85 mm
  - **QFN32** 4 mm × 4 mm × 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
EFR32MG22E224F512IM40-C	• Zigbee PRO • Zigbee Green Power • Bluetooth 5.x • Direction Finding (AoA Transmitter) • Proprietary	6 dBm	76.8 MHz	Precision	512	32	26	QFN40	-40 to 125 °C
EFR32MG22E224F512IM32-C	• Zigbee PRO • Zigbee Green Power • Bluetooth 5.x • Direction Finding (AoA Transmitter) • Proprietary	6 dBm	76.8 MHz	Precision	512	32	18	QFN32	-40 to 125 °C

Note:

1. LE Long Range (125 kbps and 500 kbps) PHYs are only supported on part numbers which include AoA/AoD direction-finding capability.
2. 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.

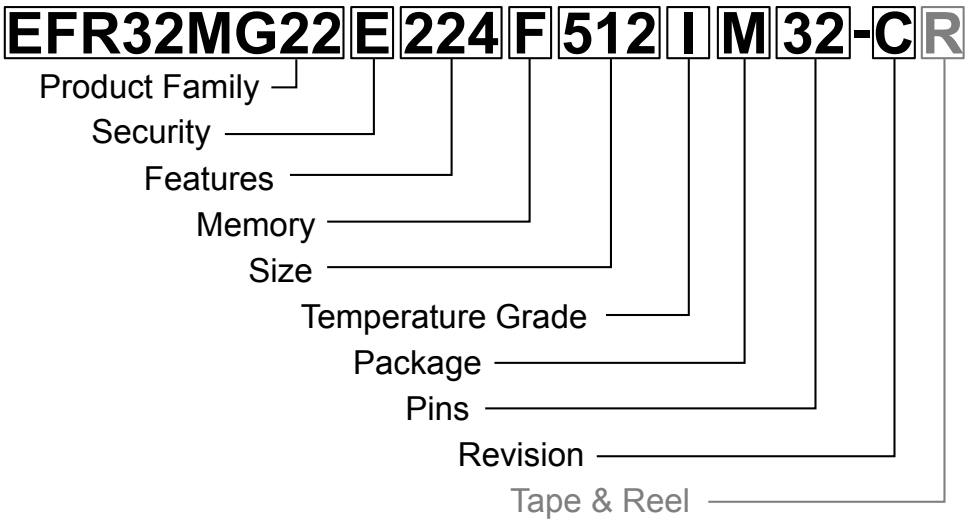


Figure 2.1. Ordering Code Key

Field	Options
Product Family	• **EFR32MG22**: Gecko 22 Family
Security	• **E**: Base Security

Features [f1][f2][f3]	• f1
	  • **1**: MCU Frequency of 38.4 MHz
	  • **2**: MCU Frequency of 76.8 MHz
	• f2
	  • **1**: 0 dBm output power
	  • **2**: 6 dBm output power
	• f3
	  • **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	• **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	• **C**: Revision C
Tape & Reel	• **R**: Tape & Reel (optional)

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