EFR32MG29 Wireless SoC Family Data Short

The EFR32MG29 wireless SoCs are ideal for battery-powered IoT end devices. With support for both buck and boost DC-DC, the device can provide the ultimate in battery flexibility. Buck DC-DC is ideal for devices that run on batteries with voltage range from 1.8 to 3.8 V, such as coin cells and dual alkaline cells. The boost DC-DC operates from 1.2 to 1.7 V and is ideal where smaller form-factor or lower cost batteries such as button cell or single alkaline cells are required.
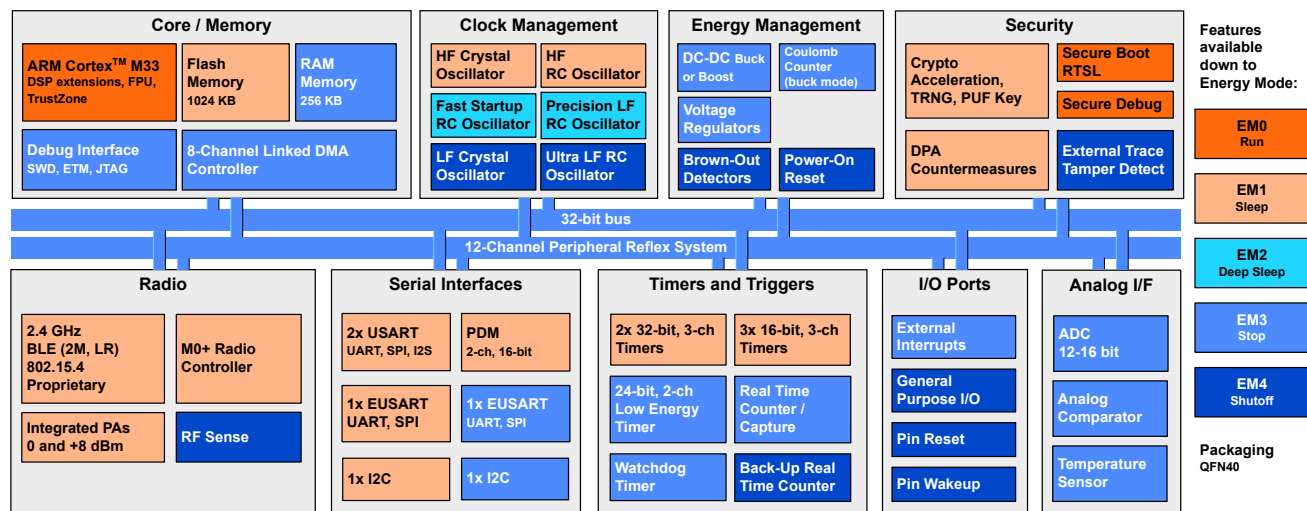
The tri-core device has a Cortex®-M33 running up to 76.8 MHz and dedicated cores for the radio and security, offloading timing critical operations. With key features like high-performance 2.4 GHz RF, low current consumption, and Secure Vault™ High, IoT device makers can create smart, robust, and energy-efficient products that are secure from remote and local cyber-attacks. In addition, 1024 KB of flash and 256 KB of RAM ensures there is enough memory for Zigbee and multiprotocol applications.

EFR32MG29 applications include battery-powered devices for:

- Smart Home
- Building Automation
- Security Systems

KEY FEATURES

- 32-bit ARM® Cortex®-M33 core with 76.8 MHz maximum operating frequency
- 1024 KB of flash and 256 KB of RAM
- Energy-efficient core with low active and sleep currents
- Integrated PA with up to 8 dBm (2.4 GHz) TX power
- Secure Vault™ High
- DC-DC supporting buck (1.8-3.8 V) or boost (1.2-1.7 V) operation
- Available in QFN packaging

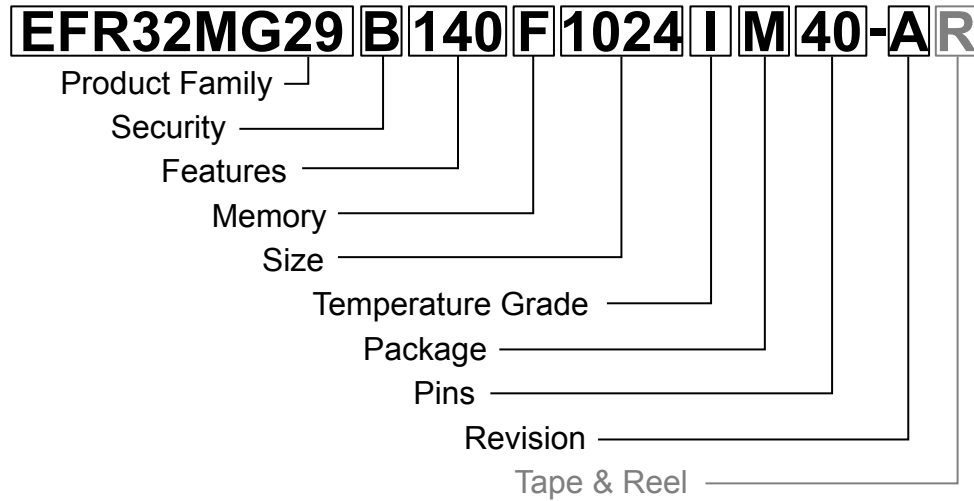# 1. Feature List

The EFR32MG29 highlighted features are:

- **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
  - 1024 KB flash program memory
  - 256 KB RAM data memory
  - 2.4 GHz radio operation
- **Radio Performance**
  - -102.2 dBm sensitivity @ 250 kbps O-QPSK DSSS
  - -106.8 dBm sensitivity @ 125 kbps GFSK
  - -99 dBm sensitivity @ 1 Mbit/s GFSK
  - -96.1 dBm sensitivity @ 2 Mbit/s GFSK
  - TX power up to 8 dBm
- **Low System Energy Consumption**
  - 4.1 mA RX current (250 kbps O-QPSK DSSS)
  - 3.6 mA RX current (1 Mbps GFSK)
  - 4 mA TX current @ 0 dBm output power
  - 9 mA TX current @ 6 dBm output power
  - 11 mA TX current @ 8 dBm output power
  - 30 µA/MHz in Active Mode (EM0) at 76.8 MHz
  - 3.4 µA EM2 DeepSleep current (256 KB RAM retention and RTC running from LFXO)
  - 1.5 µA EM2 DeepSleep current (16 KB RAM retention and RTC running from LFXO)
  - 0.16 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
  - Proprietary
- **Secure Vault High**
  - 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 Key Management with PUF
  - Anti-Tamper
  - Secure Attestation

- **Wide Selection of MCU Peripherals**
  - Analog to Digital Converter (ADC)
    - 12-bit @ 1 Msps
    - 16-bit @ 76.9 ksps
  - Analog Comparator (ACMP)
  - 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)
  - 2 × 32-bit Timer/Counter with 3 Compare/Capture/PWM channels
  - 3 × 16-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^{2}S)
  - 2 × Enhanced Universal Synchronous/Asynchronous Receiver/Transmitter (UART/SPI)
  - 2 × I^{2}C 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
  - Coulomb counter integrated into Buck DC-DC
- **Wide Operating Range**
  - Devices with Buck DC-DC
    - 1.8 to 3.8 V supply range
    - -40 to 125 °C operating temperature
  - Devices with Boost DC-DC
    - 1.2 to 1.7 V supply range
    - -20 to 55 °C operating temperature
- **Packages**
  - **QFN40** 5 × 5 × 0.85 mm, 0.4 mm pitch

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2. Ordering Information

Table 2.1. Ordering Information

Ordering Code	Protocol Stack	Max TX Power	DC-DC	Flash (KB)	RAM (KB)	GPIO	Package	Temp Range
EFR32MG29B230F1024CM40-B	• Zigbee PRO • Zigbee Green Power • Bluetooth 5.x • Direction Finding (AoA Transmitter) • Proprietary	6 dBm	Boost	1024	256	25	QFN40	-20 to 55 C
EFR32MG29B140F1024IM40-B	• Zigbee PRO • Zigbee Green Power • Bluetooth 5.x • Direction Finding (AoA Transmitter) • Proprietary	8 dBm	Buck	1024	256	26	QFN40	-40 to 125 C

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.

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EFR32MG29 **B** 140 **F** 1024 **I** **M** 40-A**R**

Product Family

Security

Features

Memory

Size

Temperature Grade

Package

Pins

Revision

Tape & Reel

Field	Options
Product Family	• **EFR32MG29**: Wireless SoC Family
Security	• **B**: Secure Vault High

Features [f1][f2][f3]	• f1
	  • **1**: DC-DC Buck Converter
	  • **2**: DC-DC Boost Converter
	• f2
	  • **3**: 6 dBm PA Transmit Power
	  • **4**: 8 dBm PA Transmit Power
	• f3
	  • **0**: 256 KB RAM

Memory	• **F**: Flash
Size	• **Memory Size** in KBytes
Temperature Grade	• **C**: -20 to +55 °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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