

# EFR32MG29 Wireless SoC Family Data Short

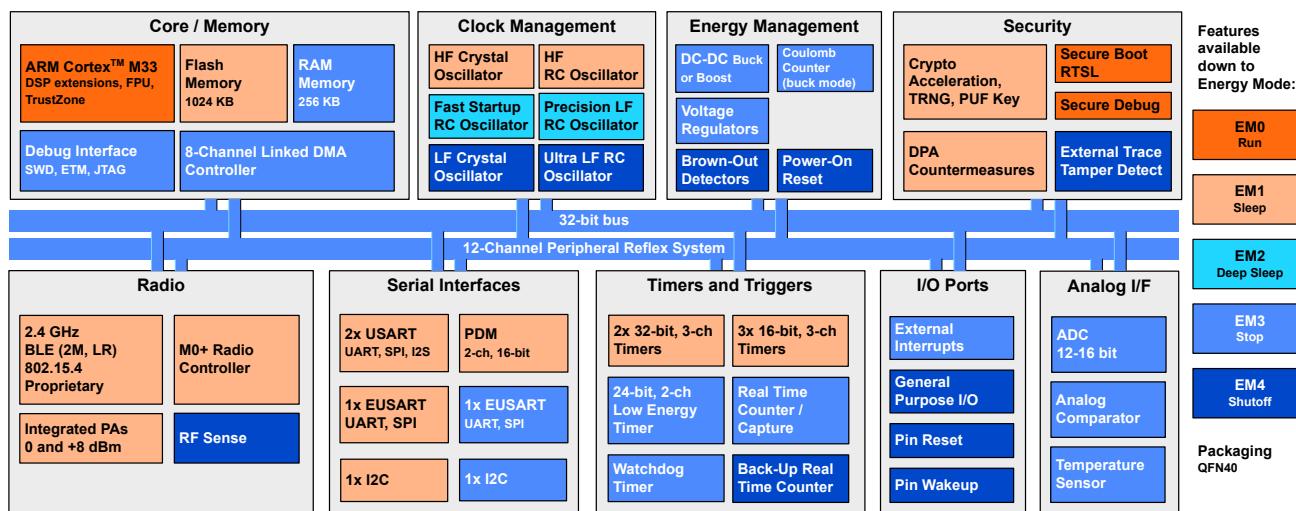
The EFR32MG29 wireless SoCs are ideal for battery-powered IoT end devices. With support for both buck and boost DC-DC, the device can provide the ultimate in battery flexibility. Buck DC-DC is ideal for devices that run on batteries with voltage range from 1.8 to 3.8 V, such as coin cells and dual alkaline 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
<ul style="list-style-type: none"> <li>• 32-bit ARM® Cortex®-M33 core with 76.8 MHz maximum operating frequency</li> <li>• 1024 KB of flash and 256 KB of RAM</li> <li>• Energy-efficient core with low active and sleep currents</li> <li>• Integrated PA with up to 8 dBm (2.4 GHz) TX power</li> <li>• Secure Vault™ High</li> <li>• DC-DC supporting buck (1.8-3.8 V) or boost (1.2-1.7 V) operation</li> <li>• Available in QFN packaging</li> </ul>



## 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  $\mu$ A/MHz in Active Mode (EM0) at 76.8 MHz
- 3.4  $\mu$ A EM2 DeepSleep current (256 KB RAM retention and RTC running from LFXO)
- 1.5  $\mu$ A EM2 DeepSleep current (16 KB RAM retention and RTC running from LFXO)
- 0.16  $\mu$ A 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 ksp
- 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<sup>2</sup>S)
- 2 × Enhanced Universal Synchronous/Asynchronous Receiver/Transmitter (UART/SPI)
- 2 × I<sup>2</sup>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

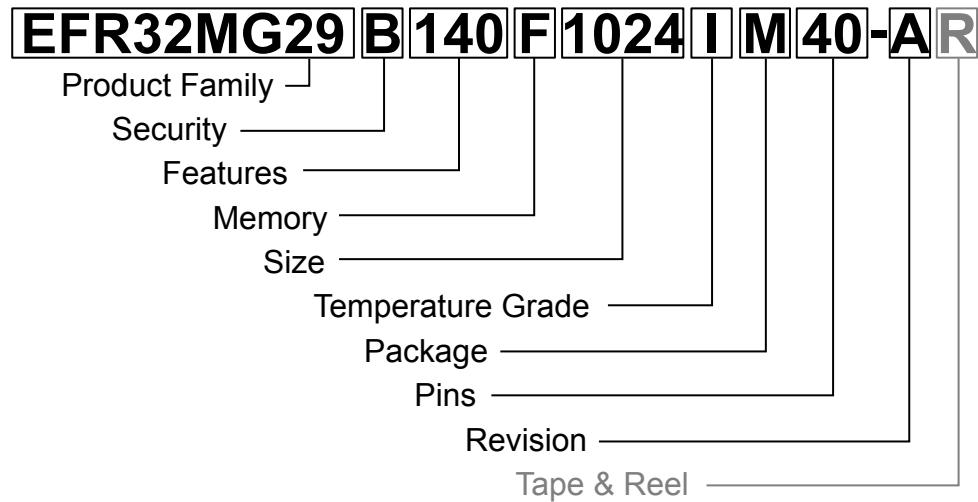
- QFN40 5 × 5 × 0.85 mm, 0.4 mm pitch

## 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	<ul style="list-style-type: none"> <li>• Zigbee PRO</li> <li>• Zigbee Green Power</li> <li>• Bluetooth 5.x</li> <li>• Direction Finding (AoA Transmitter)</li> <li>• Proprietary</li> </ul>	6 dBm	Boost	1024	256	25	QFN40	-20 to 55 C
EFR32MG29B140F1024IM40-B	<ul style="list-style-type: none"> <li>• Zigbee PRO</li> <li>• Zigbee Green Power</li> <li>• Bluetooth 5.x</li> <li>• Direction Finding (AoA Transmitter)</li> <li>• Proprietary</li> </ul>	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>.



Field	Options
Product Family	• <b>EFR32MG29</b> : Wireless SoC Family
Security	• <b>B</b> : Secure Vault High
Features [f1][f2][f3]	<ul style="list-style-type: none"> <li>• f1 <ul style="list-style-type: none"> <li>• <b>1</b>: DC-DC Buck Converter</li> <li>• <b>2</b>: DC-DC Boost Converter</li> </ul> </li> <li>• f2 <ul style="list-style-type: none"> <li>• <b>3</b>: 6 dBm PA Transmit Power</li> <li>• <b>4</b>: 8 dBm PA Transmit Power</li> </ul> </li> <li>• f3 <ul style="list-style-type: none"> <li>• <b>0</b>: 256 KB RAM</li> </ul> </li> </ul>
Memory	• <b>F</b> : Flash
Size	• <b>Memory Size</b> in KBytes
Temperature Grade	<ul style="list-style-type: none"> <li>• <b>C</b>: -20 to +55 °C</li> <li>• <b>I</b>: -40 to +125 °C</li> </ul>
Package	• <b>M</b> : QFN
Pins	• <b>Number of Package Pins</b>
Revision	• <b>A</b> : Revision A
Tape & Reel	• <b>R</b> : Tape & Reel (optional)

Figure 2.1. Ordering Code Key

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