

EFR32BG29 Wireless SoC Family Data Short

The EFR32BG29 Wireless family of SoCs is part of the EFR32 Wireless SoC portfolio. EFR32BG29 wireless SoCs are ideal for enabling energy-friendly Bluetooth networking for IoT devices.

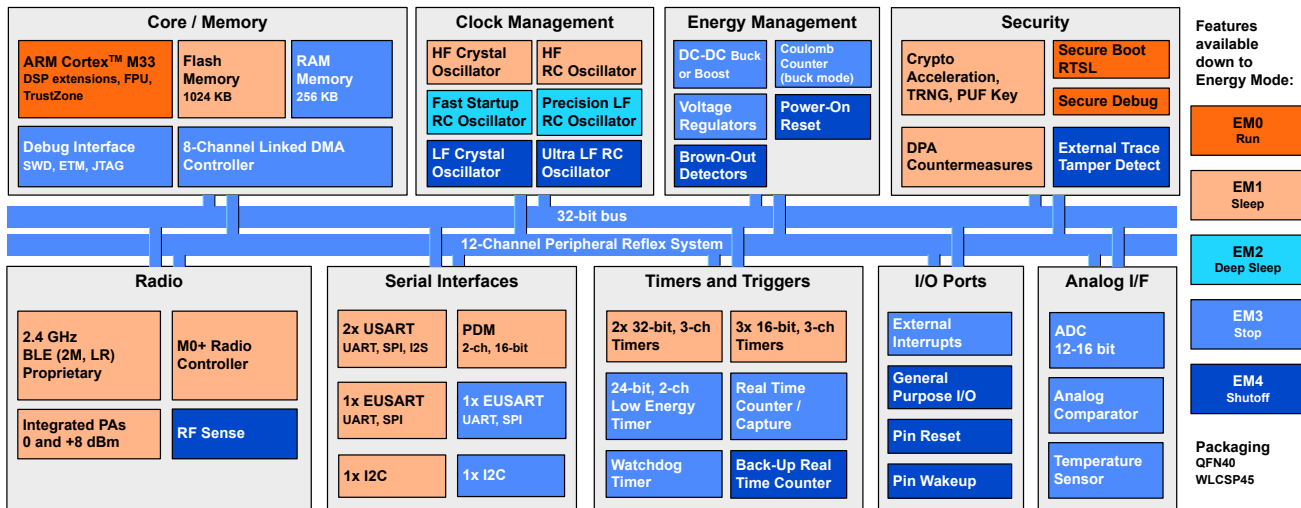
The single-die solution combines a 76.8 MHz Cortex-M33 with a high-performance 2.4 GHz radio to provide an industry-leading, energy-efficient wireless, SoC for IoT connected applications.

The devices are available with boost or buck DC-DC capabilities, enabling direct power from a wide variety of batteries.

EFR32BG29 applications include:

- Portable Medical
- Home End Devices
- Fleet/Asset Monitoring
- Industrial Automation
- Access Control
- Bluetooth Mesh
- Sports, Fitness, and Wellness devices
- Power Tools

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 WLCSP and QFN packaging



1. Feature List

The EFR32BG29 highlighted features are:

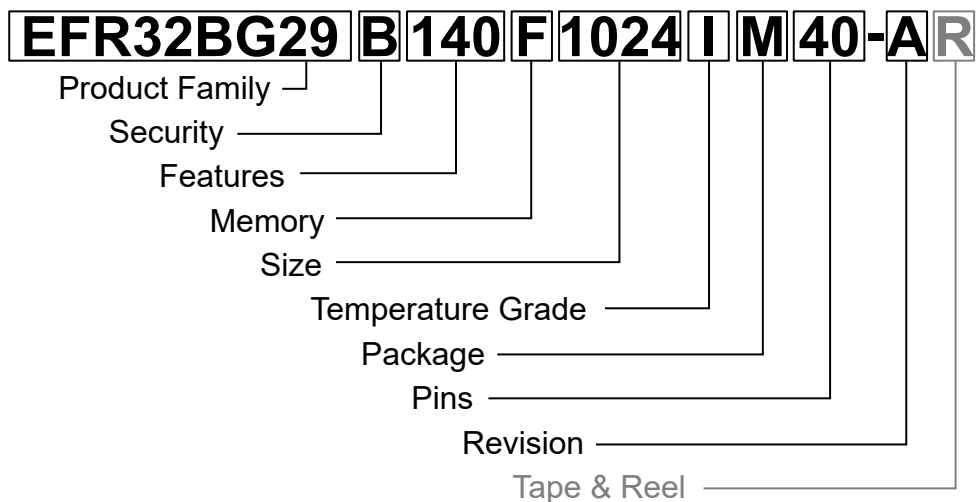
- **Low Power Wireless System-on-Chip**
 - High-performance 32-bit 76.8 MHz ARM Cortex[®]-M33 with DSP instruction and floating-point unit for efficient signal processing
 - 1024 KB flash program memory
 - 256 KB RAM data memory
 - 2.4 GHz radio operation
- **Radio Performance**
 - -106.8 dBm sensitivity @ 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**
 - 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 μ A/MHz in Active Mode (EM0) at 76.8 MHz
 - 3.4 μ A EM2 DeepSleep current (256 KB RAM retention and RTC running from LFXO)
 - 1.5 μ A EM2 DeepSleep current (16 KB RAM retention and RTC running from LFXO)
 - 0.16 μ A EM4 current
- **Supported Modulation Format**
 - 2 (G)FSK with fully configurable shaping
 - OQPSK DSSS
 - (G)MSK
- **Protocol Support**
 - 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 kbps
 - 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 \times 32-bit Timer/Counter with 3 Compare/Capture/PWM channels
 - 3 \times 16-bit Timer/Counter with 3 Compare/Capture/PWM channels
 - 32-bit Real Time Counter
 - 24-bit Low Energy Timer for waveform generation
 - 1 \times Watchdog Timer
 - 2 \times Universal Synchronous/Asynchronous Receiver/Transmitter (UART/SPI/SmartCard (ISO 7816)/IrDA/I²S)
 - 2 \times Enhanced Universal Synchronous/Asynchronous Receiver/Transmitter (UART/SPI)
 - 2 \times I²C 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 $^{\circ}$ C operating temperature
 - Devices with Boost DC-DC
 - 1.2 to 1.7 V supply range
 - -20 to 55 $^{\circ}$ C operating temperature
- **Packages**
 - **QFN40** 5 \times 5 \times 0.85 mm, 0.4 mm pitch
 - **WLCSP45** 2.825 \times 2.657 \times 0.5 mm, 0.35 mm pitch (Boost DC-DC configuration)

2. Ordering Information

Table 2.1. Ordering Information

Ordering Code	Protocol Stack	Max TX Power	DC-DC	Flash (KB)	RAM (KB)	GPI O	Package	Temp Range
EFR32BG29B230F1024CM40-B	<ul style="list-style-type: none"> • Bluetooth 5.x • Direction Finding (AoA Transmitter) • Proprietary 	6 dBm	Boost	1024	256	25	QFN40	-20 to 55 C
EFR32BG29B220F1024CJ45-B	<ul style="list-style-type: none"> • Bluetooth 5.x • Direction Finding (AoA Transmitter) • Proprietary 	4 dBm	Boost	1024	256	19	WLCSP45	-20 to 55 C
EFR32BG29B140F1024IM40-B	<ul style="list-style-type: none"> • 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>.



Field	Options
Product Family	<ul style="list-style-type: none"> • EFR32BG29: Wireless SoC Family
Security	<ul style="list-style-type: none"> • B: Secure Vault High
Features [f1][f2][f3]	<ul style="list-style-type: none"> • f1 <ul style="list-style-type: none"> • 1: DC-DC Buck Converter • 2: DC-DC Boost Converter • f2 <ul style="list-style-type: none"> • 2: 4 dBm PA Transmit Power • 3: 6 dBm PA Transmit Power • 4: 8 dBm PA Transmit Power • f3 <ul style="list-style-type: none"> • 0: 256 KB RAM
Memory	<ul style="list-style-type: none"> • F: Flash
Size	<ul style="list-style-type: none"> • Memory Size in KBytes
Temperature Grade	<ul style="list-style-type: none"> • C: -20 to +55 °C • I: -40 to +125 °C
Package	<ul style="list-style-type: none"> • M: QFN • J: WLCSP
Pins	<ul style="list-style-type: none"> • Number of Package Pins
Revision	<ul style="list-style-type: none"> • A: Revision A
Tape & Reel	<ul style="list-style-type: none"> • R: Tape & Reel (optional)

Figure 2.1. Ordering Code Key

Simplicity Studio

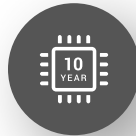
One-click access to MCU and wireless tools, documentation, software, source code libraries & more. Available for Windows, Mac and Linux!



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Silicon Laboratories Inc.
400 West Cesar Chavez
Austin, TX 78701
USA

www.silabs.com