EFR32BG27 Wireless Gecko SoC Family Data Short

The EFR32BG27 Wireless Gecko family of SoCs is part of the Wireless Gecko portfolio. EFR32BG27 Wireless Gecko SoCs are ideal for enabling energy-friendly Bluetooth 5.x 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.

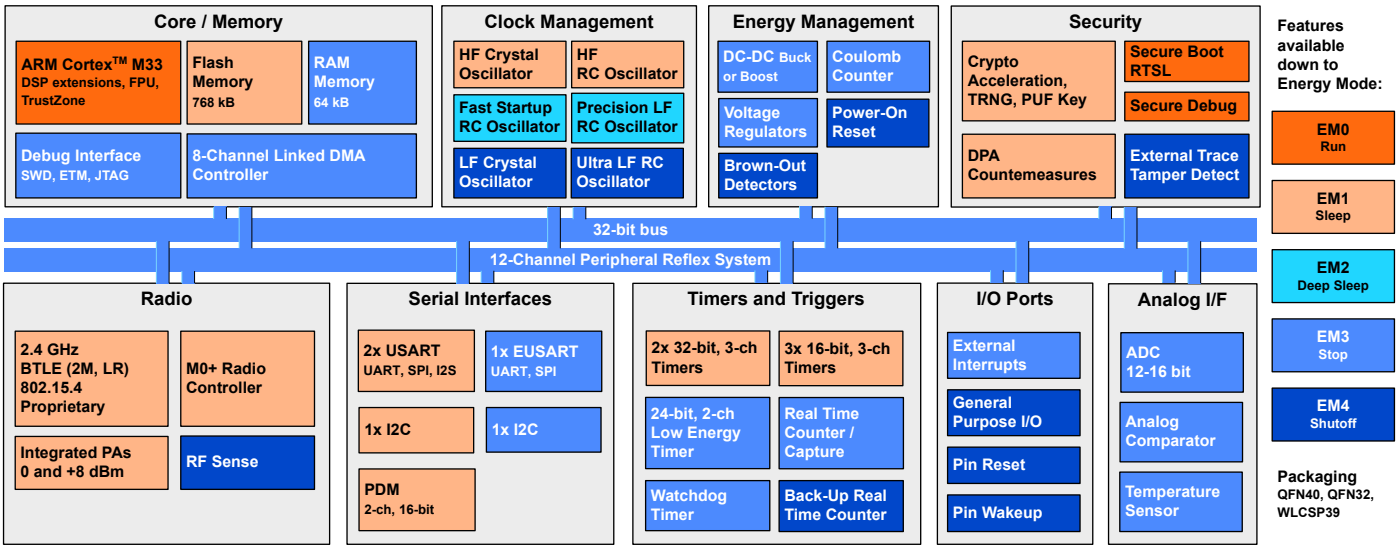
The devices are available with boost or buck DC-DC capabilities, enabling direct power from a wide variety of batteries.

Wireless Gecko 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
- 768 kB of flash and 64 kB of RAM
- Energy-efficient radio core with low active and sleep currents
- Integrated PA with up to 8 dBm (2.4 GHz) TX power
- Secure Boot with Root of Trust and Secure Loader (RTSL)
- Pin compatibility / feature superset with EFR32xG22 in QFN
- DC-DC supporting buck (1.8-3.8 V) or boost (0.8 - 1.7 V) operation
- Available in WLCSP and QFN packaging



1. Feature List

The EFR32BG27 highlighted features are listed below.

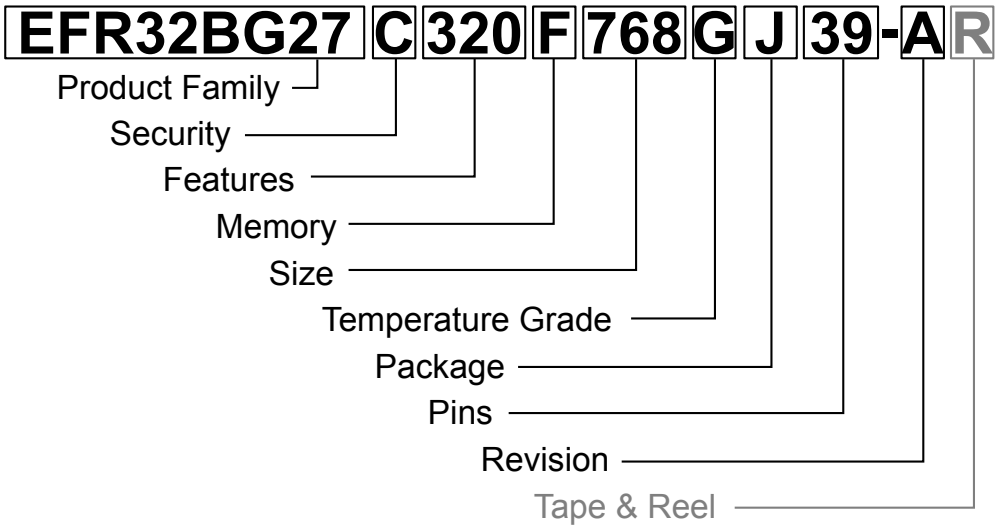
- **Low Power Wireless System-on-Chip**
  - High Performance 32-bit 76.8 MHz MHz ARM Cortex®-M33 with DSP instruction and floating-point unit for efficient signal processing
  - 768 kB flash program memory
  - 64 kB RAM data memory
  - 2.4 GHz radio operation
- **Radio Performance**
  - -106.7 dBm sensitivity @ 125 kbps GFSK
  - -98.9 dBm sensitivity @ 1 Mbit/s GFSK
  - -96.2 dBm sensitivity @ 2 Mbit/s GFSK
  - TX power up to 8 dBm
- **Low System Energy Consumption**
  - 3.6 mA RX current (1 Mbps GFSK)
  - 4.1 mA TX current @ 0 dBm output power
  - 9.2 mA TX current @ 6 dBm output power
  - 11.3 mA TX current @ 8 dBm output power
  - 29 µA/MHz in Active Mode (EM0) at 76.8 MHz
  - 1.6 µA EM2 DeepSleep current (64 kB RAM retention and RTC running from LFXO)
  - 0.18 µA EM4 current
- **Supported Modulation Format**
  - 2 (G)FSK with fully configurable shaping
  - OQPSK DSSS
  - (G)MSK
- **Protocol Support**
  - Bluetooth Low Energy (Bluetooth 5.x)
  - Proprietary
- **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
  - DPA Countermeasures
  - Key Management with PUF
  - True Random Number Generator (TRNG) compliant with NIST SP800-90 and AIS-31
  - ARM® TrustZone®
  - Secure Debug with lock/unlock
  - External Tamper Detect
- **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^2S)
  - 1 × Enhanced Universal Synchronous/Asynchronous Receiver/Transmitter (UART/SPI)
  - 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
  - Coulomb counter integrated into DC-DC
- **Wide Operating Range**
  - 1.8 V to 3.8 V single power supply for devices with Buck DC-DC
  - 0.8 V to 1.7 V single power supply for devices with Boost DC-DC
  - -40 °C to 125 °C
- **Packages**
  - **QFN40** 5 mm × 5 mm × 0.85 mm, 0.4 mm pitch
  - **QFN32** 4 mm × 4 mm × 0.85 mm, 0.4 mm pitch
  - **WLCSP39** 2.291 mm × 2.624 mm × 0.5 mm, 0.35 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
EFR32BG27C320F768GJ39-B	• Bluetooth 5.x • Direction Finding (AoA Transmitter) • Proprietary	4 dBm	Buck or Boost	768	64	19	WLCSP39	-40 to 85 °C
EFR32BG27C230F768IM40-B	• Bluetooth 5.x • Direction Finding (AoA Transmitter) • Proprietary	6 dBm	Boost	768	64	25	QFN40	-40 to 125 °C
EFR32BG27C230F768IM32-B	• Bluetooth 5.x • Direction Finding (AoA Transmitter) • Proprietary	6 dBm	Boost	768	64	17	QFN32	-40 to 125 °C
EFR32BG27C140F768IM40-B	• Bluetooth 5.x • Direction Finding (AoA Transmitter) • Proprietary	8 dBm	Buck	768	64	26	QFN40	-40 to 125 °C
EFR32BG27C140F768IM32-B	• Bluetooth 5.x • Direction Finding (AoA Transmitter) • Proprietary	8 dBm	Buck	768	64	18	QFN32	-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	• **EFR32BG27**: Wireless Gecko BG27 Family
Security	• **C**: Secure Vault Mid

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

Memory	• **F**: Flash
Size	• **Memory Size** in kBytes
Temperature Grade	• **G**: -40 to +85 °C • **I**: -40 to +125 °C
Package	• **M**: QFN • **J**: WLCSP
Pins	• **Number of Package Pins**
Revision	• **A**: Revision A • **B**: Revision B
Tape & Reel	• **R**: Tape & Reel (optional)

Figure 2.1. Ordering Code Key

Table of Contents

3. Revision History

Revision 0.3

March, 2023

Updated characterization results with latest data.

Revision 0.1

December, 2022

Initial release.