

# EFR32MG27 Wireless Gecko SoC Family

## Data Short



The EFR32MG27 Wireless Gecko multiprotocol family of SoCs is part of the Wireless Gecko portfolio. EFR32MG27 Wireless Gecko SoCs are ideal for enabling energy-friendly multiprotocol 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.

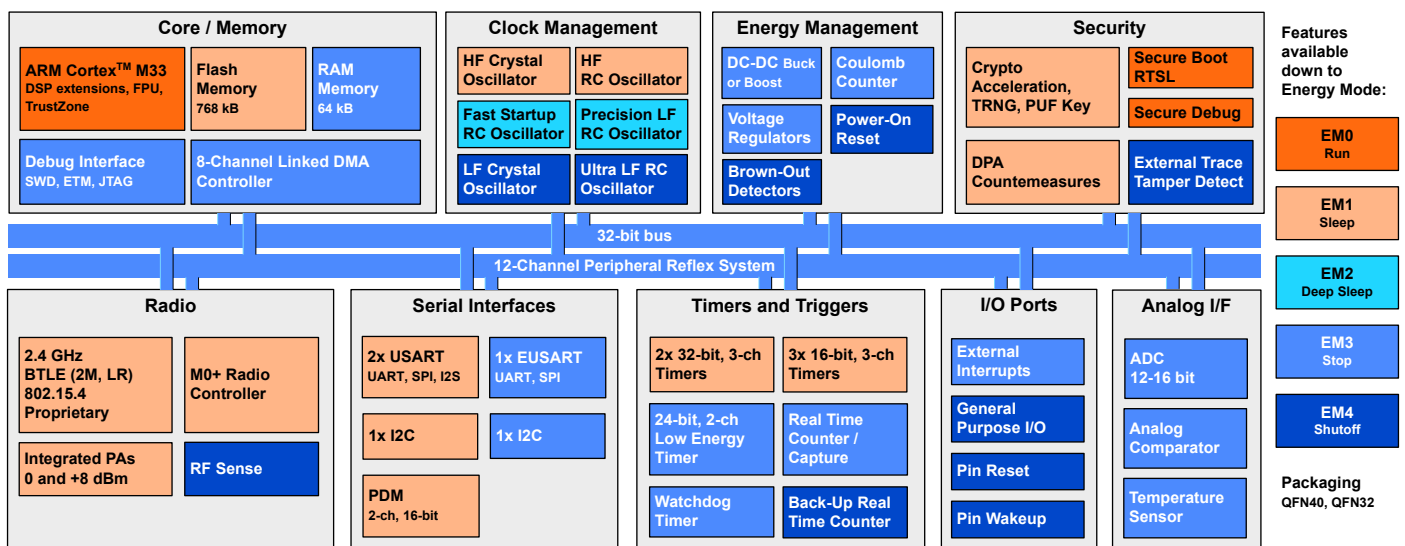
The devices are available with boost or buck DC-DC capabilities, enabling direct power from a wide variety of batteries.

Wireless Gecko applications include:

- Home End Devices
- Mesh Networking
- Fleet/Asset Monitoring
- Industrial Automation
- Access Control
- 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
- DC-DC supporting buck (1.8-3.8 V) or boost (0.8 - 1.7 V) operation



## 1. Feature List

The EFR32MG27 highlighted features are listed below.

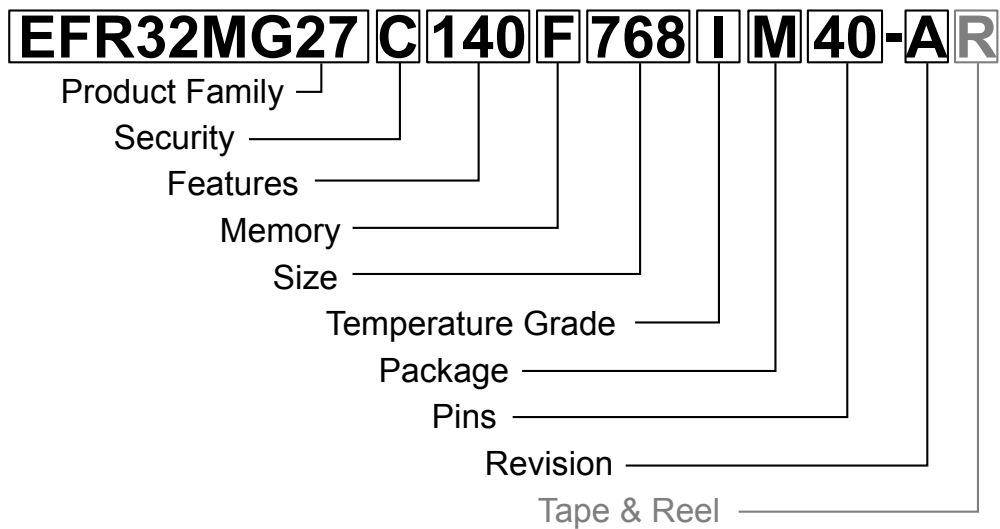
- **Low Power Wireless System-on-Chip**
  - High Performance 32-bit 76.8 MHz ARM Cortex<sup>®</sup>-M33 with DSP instruction and floating-point unit for efficient signal processing
  - 768 kB flash program memory
  - 64 kB RAM data memory
  - 2.4 GHz radio operation
- **Radio Performance**
  - -102.3 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 8 dBm
- **Low System Energy Consumption**
  - 4.0 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
  - 9.2 mA TX current @ 6 dBm output power
  - 11.3 mA TX current @ 8 dBm output power
  - 29  $\mu$ A/MHz in Active Mode (EM0) at 76.8 MHz
  - 1.6  $\mu$ A EM2 DeepSleep current (64 kB RAM retention and RTC running from LFXO)
  - 0.18  $\mu$ 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 (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<sup>®</sup> TrustZone<sup>®</sup>
  - 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  $\times$  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/I<sup>2</sup>S)
  - 1  $\times$  Enhanced Universal Synchronous/Asynchronous Receiver/Transmitter (UART/SPI)
  - 2  $\times$  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  $\pm$ 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  $\times$  5 mm  $\times$  0.85 mm, 0.4 mm pitch
  - **QFN32** 4 mm  $\times$  4 mm  $\times$  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
EFR32MG27C230F768IM40-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	768	64	25	QFN40	-40 to 125 °C
EFR32MG27C230F768IM32-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	768	64	17	QFN32	-40 to 125 °C
EFR32MG27C140F768IM40-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	768	64	26	QFN40	-40 to 125 °C
EFR32MG27C140F768IM32-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	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	<ul style="list-style-type: none"> <li>• <b>EFR32MG27</b>: Wireless Gecko MG27 Family</li> </ul>
Security	<ul style="list-style-type: none"> <li>• <b>C</b>: Secure Vault Mid</li> </ul>
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>: Unused</li> </ul> </li> </ul>
Memory	<ul style="list-style-type: none"> <li>• <b>F</b>: Flash</li> </ul>
Size	<ul style="list-style-type: none"> <li>• <b>Memory Size</b> in kBytes</li> </ul>
Temperature Grade	<ul style="list-style-type: none"> <li>• <b>I</b>: -40 to +125 °C</li> </ul>
Package	<ul style="list-style-type: none"> <li>• <b>M</b>: QFN</li> </ul>
Pins	<ul style="list-style-type: none"> <li>• <b>Number of Package Pins</b></li> </ul>
Revision	<ul style="list-style-type: none"> <li>• <b>A</b>: Revision A</li> <li>• <b>B</b>: Revision B</li> </ul>
Tape & Reel	<ul style="list-style-type: none"> <li>• <b>R</b>: Tape &amp; Reel (optional)</li> </ul>

Figure 2.1. Ordering Code Key

# Table of Contents

- 1. Feature List . . . . . 2
- 2. Ordering Information . . . . . 3
- 3. Revision History . . . . . 6

### 3. Revision History

#### Revision 0.3

March, 2023

Updated characterization results with latest data.

#### Revision 0.1

December, 2022

Initial release.

# Simplicity Studio

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



**IoT Portfolio**  
[www.silabs.com/IoT](http://www.silabs.com/IoT)



**SW/HW**  
[www.silabs.com/simplicity](http://www.silabs.com/simplicity)



**Quality**  
[www.silabs.com/quality](http://www.silabs.com/quality)



**Support & Community**  
[www.silabs.com/community](http://www.silabs.com/community)

## Disclaimer

Silicon Labs intends to provide customers with the latest, accurate, and in-depth documentation of all peripherals and modules available for system and software implementers using or intending to use the Silicon Labs products. Characterization data, available modules and peripherals, memory sizes and memory addresses refer to each specific device, and "Typical" parameters provided can and do vary in different applications. Application examples described herein are for illustrative purposes only. Silicon Labs reserves the right to make changes without further notice to the product information, specifications, and descriptions herein, and does not give warranties as to the accuracy or completeness of the included information. Without prior notification, Silicon Labs may update product firmware during the manufacturing process for security or reliability reasons. Such changes will not alter the specifications or the performance of the product. Silicon Labs shall have no liability for the consequences of use of the information supplied in this document. This document does not imply or expressly grant any license to design or fabricate any integrated circuits. The products are not designed or authorized to be used within any FDA Class III devices, applications for which FDA premarket approval is required or Life Support Systems without the specific written consent of Silicon Labs. A "Life Support System" is any product or system intended to support or sustain life and/or health, which, if it fails, can be reasonably expected to result in significant personal injury or death. Silicon Labs products are not designed or authorized for military applications. Silicon Labs products shall under no circumstances be used in weapons of mass destruction including (but not limited to) nuclear, biological or chemical weapons, or missiles capable of delivering such weapons. Silicon Labs disclaims all express and implied warranties and shall not be responsible or liable for any injuries or damages related to use of a Silicon Labs product in such unauthorized applications.

**Note: This content may contain offensive terminology that is now obsolete. Silicon Labs is replacing these terms with inclusive language wherever possible. For more information, visit [www.silabs.com/about-us/inclusive-lexicon-project](http://www.silabs.com/about-us/inclusive-lexicon-project)**

## Trademark Information

Silicon Laboratories Inc.<sup>®</sup>, Silicon Laboratories<sup>®</sup>, Silicon Labs<sup>®</sup>, SiLabs<sup>®</sup> and the Silicon Labs logo<sup>®</sup>, Bluegiga<sup>®</sup>, Bluegiga Logo<sup>®</sup>, EFM<sup>®</sup>, EFM32<sup>®</sup>, EFR, Ember<sup>®</sup>, Energy Micro, Energy Micro logo and combinations thereof, "the world's most energy friendly microcontrollers", Redpine Signals<sup>®</sup>, WiSeConnect, n-Link, ThreadArch<sup>®</sup>, EZLink<sup>®</sup>, EZRadio<sup>®</sup>, EZRadioPRO<sup>®</sup>, Gecko<sup>®</sup>, Gecko OS, Gecko OS Studio, Precision32<sup>®</sup>, Simplicity Studio<sup>®</sup>, Telegesis, the Telegesis Logo<sup>®</sup>, USBXpress<sup>®</sup>, Zentri, the Zentri logo and Zentri DMS, Z-Wave<sup>®</sup>, and others are trademarks or registered trademarks of Silicon Labs. ARM, CORTEX, Cortex-M3 and THUMB are trademarks or registered trademarks of ARM Holdings. Keil is a registered trademark of ARM Limited. Wi-Fi is a registered trademark of the Wi-Fi Alliance. All other products or brand names mentioned herein are trademarks of their respective holders.



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

[www.silabs.com](http://www.silabs.com)