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 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 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/I²S)
  - 1 × Enhanced Universal Synchronous/Asynchronous Receiver/Transmitter (UART/SPI)
  - 2 × 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 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
### Table 2.1. Ordering Information

<table>
<thead>
<tr>
<th>Ordering Code</th>
<th>Protocol Stack</th>
<th>Max TX Power</th>
<th>DC-DC</th>
<th>Flash (kB)</th>
<th>RAM (kB)</th>
<th>GPIO</th>
<th>Package</th>
<th>Temp Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR32BG27C320F768GJ39-B</td>
<td>• Bluetooth 5.x</td>
<td>4 dBm</td>
<td>Buck or Boost</td>
<td>768</td>
<td>64</td>
<td>19</td>
<td>WLCSP39</td>
<td>-40 to 85 °C</td>
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<td></td>
<td>• Direction Finding (AoA Transmitter)</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>• Proprietary</td>
<td></td>
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<tr>
<td>EFR32BG27C230F768IM40-B</td>
<td>• Bluetooth 5.x</td>
<td>6 dBm</td>
<td>Boost</td>
<td>768</td>
<td>64</td>
<td>25</td>
<td>QFN40</td>
<td>-40 to 125 °C</td>
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<td>• Direction Finding (AoA Transmitter)</td>
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<td>EFR32BG27C230F768IM32-B</td>
<td>• Bluetooth 5.x</td>
<td>6 dBm</td>
<td>Boost</td>
<td>768</td>
<td>64</td>
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<tr>
<td>EFR32BG27C140F768IM40-B</td>
<td>• Bluetooth 5.x</td>
<td>8 dBm</td>
<td>Buck</td>
<td>768</td>
<td>64</td>
<td>26</td>
<td>QFN40</td>
<td>-40 to 125 °C</td>
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<tr>
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<td>• Direction Finding (AoA Transmitter)</td>
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<tr>
<td>EFR32BG27C140F768IM32-B</td>
<td>• Bluetooth 5.x</td>
<td>8 dBm</td>
<td>Buck</td>
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</table>

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](https://www.silabs.com/bluetooth-hardware).
### Figure 2.1. Ordering Code Key

<table>
<thead>
<tr>
<th>Field</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Family</td>
<td>• <strong>EFR32BG27</strong>: Wireless Gecko BG27 Family</td>
</tr>
<tr>
<td>Security</td>
<td>• C: Secure Vault Mid</td>
</tr>
<tr>
<td>Features [f1][f2][f3]</td>
<td>• f1</td>
</tr>
<tr>
<td></td>
<td>• 1: DC-DC Buck Converter</td>
</tr>
<tr>
<td></td>
<td>• 2: DC-DC Boost Converter</td>
</tr>
<tr>
<td></td>
<td>• 3: DC-DC Buck or Boost Converter</td>
</tr>
<tr>
<td></td>
<td>• f2</td>
</tr>
<tr>
<td></td>
<td>• 2: 4 dBm PA Transmit Power</td>
</tr>
<tr>
<td></td>
<td>• 3: 6 dBm PA Transmit Power</td>
</tr>
<tr>
<td></td>
<td>• 4: 8 dBm PA Transmit Power</td>
</tr>
<tr>
<td></td>
<td>• f3</td>
</tr>
<tr>
<td></td>
<td>• 0: Unused</td>
</tr>
<tr>
<td>Memory</td>
<td>• F: Flash</td>
</tr>
<tr>
<td>Size</td>
<td>• <strong>Memory Size</strong> in kBytes</td>
</tr>
<tr>
<td>Temperature Grade</td>
<td>• G: -40 to +85 °C</td>
</tr>
<tr>
<td></td>
<td>• I: -40 to +125 °C</td>
</tr>
<tr>
<td>Package</td>
<td>• M: QFN</td>
</tr>
<tr>
<td></td>
<td>• J: WLCSP</td>
</tr>
<tr>
<td>Pins</td>
<td>• <strong>Number of Package Pins</strong></td>
</tr>
<tr>
<td>Revision</td>
<td>• A: Revision A</td>
</tr>
<tr>
<td></td>
<td>• B: Revision B</td>
</tr>
<tr>
<td>Tape &amp; Reel</td>
<td>• R: Tape &amp; Reel (optional)</td>
</tr>
</tbody>
</table>
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
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www.silabs.com/simplicity

Quality
www.silabs.com/quality

Support & Community
www.silabs.com/community

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