EFR32BG2B Wireless SoC Family Data Short

The EFR32BG2B™ wireless family of SoCs is part of the EFR32 Wireless SoC portfolio. EFR32BG2B Wireless SoCs are ideal for wireless connectivity using Bluetooth Low Energy for long-lifetime battery-powered IoT end devices.

The single-die solution combines a Cortex®-M33 running at up to 80 MHz with dedicated radio and security cores to offload timing-critical operations. With key features like high-performance 2.4 GHz RF supporting Bluetooth® Channel Sounding, 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 cyberattacks.

EFR32BG2B applications include:

- Electronic Shelf Label (ESL)
- Logistics and Asset Tracking
- Animal Monitoring
- Energy Conversion and Storage
- Industrial Automation
- Gateway Devices

KEY FEATURES

- 32-bit ARM® Cortex®-M33 core with 80 MHz maximum operating frequency
- 1016 KB of flash and up to 128 KB of RAM
- Energy-efficient core with low active and sleep currents
- Integrated PA with up to 8 dBm (2.4 GHz) TX power
- AEC-Q100 Grade 1
- Channel Sounding
- Secure Vault™ High
- DC-DC supporting buck (1.8-3.8 V) operation
- Available in QFN packaging

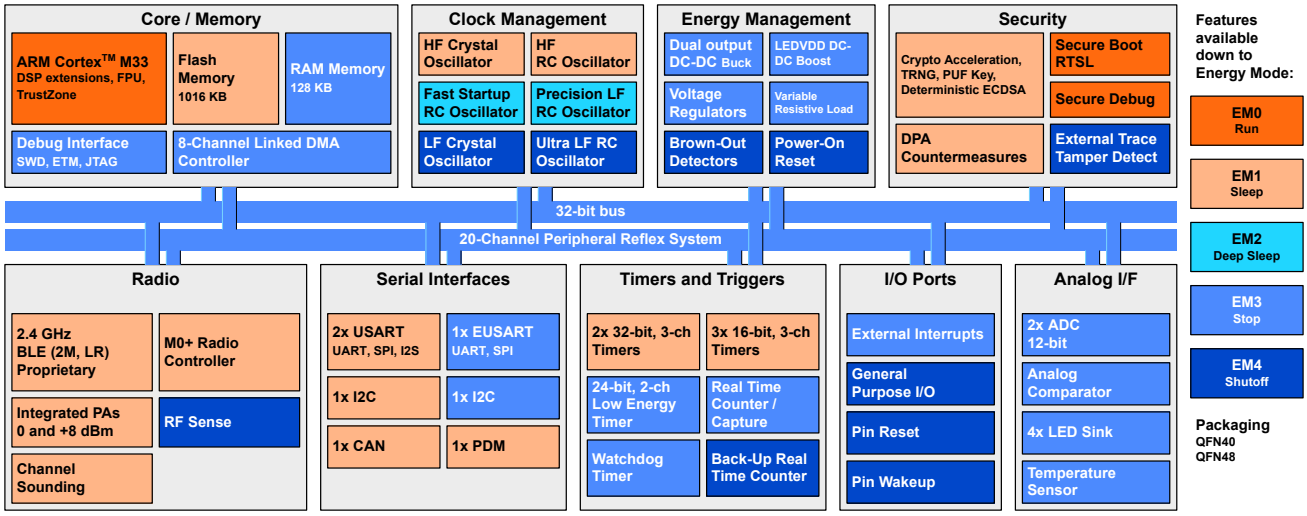

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Table of Contents

1. Feature List 3
2. Ordering Information 4
3. Revision History 6

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1. Feature List

The EFR32BG2B highlighted features are:

- **Low-Power Wireless System-on-Chip**
  - High-performance 32-bit 80 MHz ARM Cortex®-M33 with DSP instruction and floating-point unit for efficient signal processing
  - 1016 KB flash program memory
  - Up to 128 KB RAM data memory
  - 2.4 GHz radio operation
- **Radio Performance**
  - -102.1 dBm sensitivity @ 250 kbps O-QPSK DSSS
  - -106.8 dBm sensitivity @ 125 kbps GFSK
  - -99.0 dBm sensitivity @ 1 Mbps GFSK
  - -96.1 dBm sensitivity @ 2 Mbps GFSK
  - TX power up to 8 dBm
- **Low System Energy Consumption**
  - 3.1 mA RX current @ 1 Mbps GFSK (Dual output DC-DC, 3 V)
  - 4.1 mA TX current @ 0 dBm output power (Dual output DC-DC, 3 V)
  - 11.06 mA TX current @ 8 dBm output power (Dual output DC-DC, 3 V)
  - 23 µA/MHz in Active Mode (EM0) at 80 MHz (Dual output DC-DC, 3 V)
  - 1.5 µA EM2 DeepSleep current (128 KB RAM retention and RTC running from LFXO, Dual output DC-DC, 3 V)
  - 1.1 µA EM2 DeepSleep current (16 KB RAM retention and RTC running from LFXO, Dual output DC-DC, 3 V)
  - 0.17 µA EM4 current
- **Supported Modulation Format**
  - OQPSK DSSS
  - 2 (G)FSK with fully configurable shaping
  - (G)MSK
- **Protocol Support**
  - Bluetooth Low Energy 6.x
  - Channel Sounding
  - 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
  - Designed for PSA level 3 certification
- **Wide Selection of MCU Peripherals**
  - 2 x Analog to Digital Converter (ADC)
    - 12-bit @ 1 Msps
  - Analog Comparator (ACMP)
  - Up to 32 General Purpose I/O pins with output state retention and asynchronous interrupts
  - 8 Channel DMA Controller
  - 20 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
  - 1 x Digital microphone interface (PDM)
  - 1 × Controller Area Network (CAN) with Flexible Data-Rate (CAN FD)
  - Precision Low-Frequency RC Oscillator to replace 32 kHz sleep crystal
  - RFSENSE with selective OOK mode
  - Die temperature sensor with +/-1.5 °C accuracy after single-point calibration
  - 2 × Variable Resistive Load (VRL), switchable load on VREGVDD for measuring battery internal resistance and estimating remaining capacity.
  - 4 × adjustable constant-current LED sinks with built-in blink pattern generator and PWM brightness control
- **Wide Operating Range**
  - 1.8 to 3.8 V supply range
  - -40 to 125 °C operating temperature
- **Packages**
  - **QFN40** 5 × 5 × 0.85 mm, 0.4 mm pitch
  - **QFN48** 6 × 6 × 0.85 mm, 0.4 mm pitch

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2. Ordering Information

Table 2.1. Ordering Information

Ordering Code	Protocol Stack	Additional Features	Flash (KB)	RAM (KB)	GPIO	Package
EFR32BG2BB312F1016IM48-A	• Bluetooth 6.x • Direction Finding (AoA Transmitter) • Proprietary	• LED Sink • Channel Sounding	1016	128	28	QFN48
EFR32BG2BB312F1016IM40-A	• Bluetooth 6.x • Direction Finding (AoA Transmitter) • Proprietary	• LED Sink • Channel Sounding	1016	128	22	QFN40
EFR32BG2BB311F1016IM48-A	• Bluetooth 6.x • Direction Finding (AoA Transmitter) • Proprietary	• CAN • Channel Sounding	1016	128	32	QFN48
EFR32BG2BB311F1016IM40-A	• Bluetooth 6.x • Direction Finding (AoA Transmitter) • Proprietary	• CAN • Channel Sounding	1016	128	26	QFN40
EFR32BG2BB310F1016IM48-A	• Bluetooth 6.x • Direction Finding (AoA Transmitter) • Proprietary	Channel Sounding	1016	128	32	QFN48
EFR32BG2BB310F1016IM40-A	• Bluetooth 6.x • Direction Finding (AoA Transmitter) • Proprietary	Channel Sounding	1016	128	26	QFN40
EFR32BG2BB211F1016IM40-A	• Bluetooth 6.x • Direction Finding (AoA Transmitter) • Proprietary	CAN	1016	128	26	QFN40
EFR32BG2BB012F1016IM48-A	• Bluetooth 6.x • Direction Finding (AoA Transmitter) • Proprietary	LED Sink	1016	64	28	QFN48
EFR32BG2BB012F1016IM40-A	• Bluetooth 6.x • Direction Finding (AoA Transmitter) • Proprietary	LED Sink	1016	64	22	QFN40

Bluetooth 6.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.

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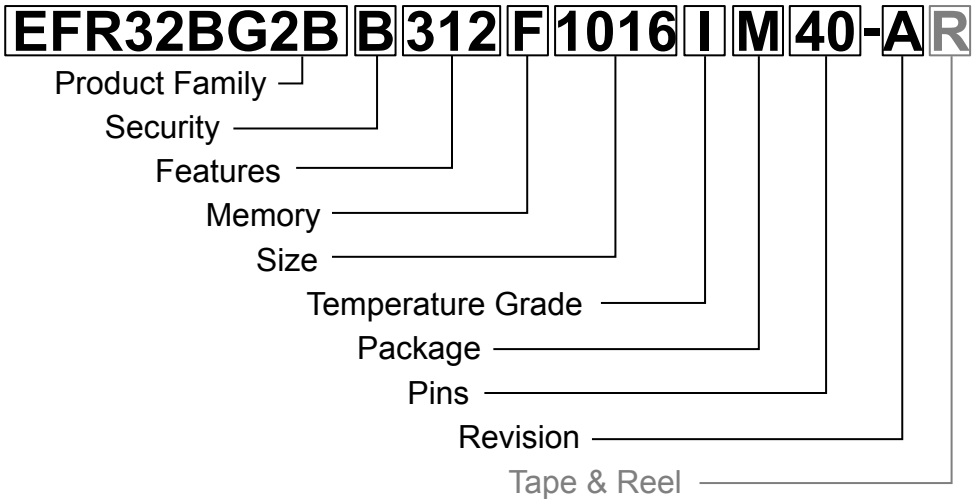

Figure 2.1. Ordering Code Key

Field	Options
Product Family	• **EFR32BG2B**: Wireless SoC Family
Security	• **B**: Secure Vault High

Features [f1][f2][f3]	• **f1**
	  • 0: No Channel Sounding, 64KB SRAM
	  • 1: Channel Sounding, 64KB SRAM
	  • 2: No Channel Sounding, 128KB SRAM
	  • 3: Channel Sounding, 128KB SRAM
	• **f2**
	  • 1: 8 dBm PA Transmit Power
	• **f3**
	  • 0: Without CAN, without LED Sinks
	  • 1: With CAN, without LED Sinks
	  • 2: Without CAN, with LED Sinks
	  • 3: With CAN, with LED Sinks

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

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3. Revision History

Revision 0.3

August, 2026

- Updated characterization results with latest data.

Revision 0.2

April, 2026

- Initial release.

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