

BGM13S Blue Gecko *Bluetooth*® SiP Module Data Sheet



The BGM13S is Silicon Labs' first SiP module solution for *Bluetooth* 5.0 LE connectivity. It supports 2 Mbps, 1 Mbps and coded LE Bluetooth PHYs. Also, with 512 kB of flash and 64 kB of RAM, the BGM13S is suited to meet Bluetooth Mesh networking memory requirements effectively.

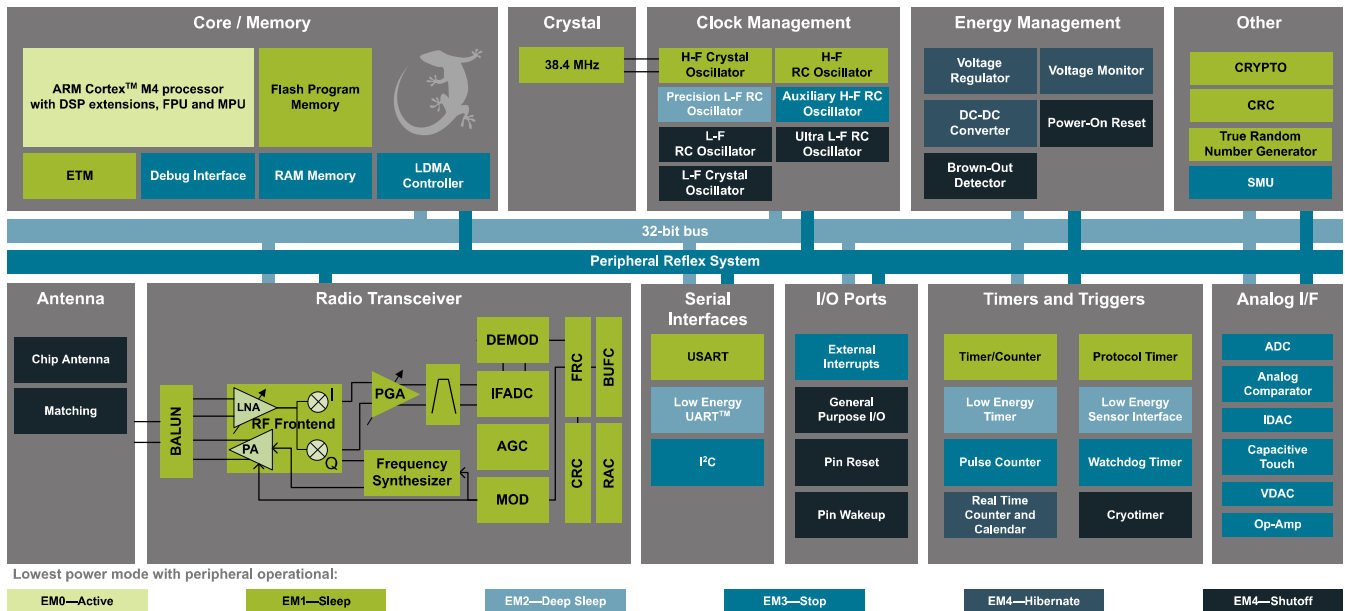
Based on the EFR32BG13 Blue Gecko SoC, the BGM13S delivers robust RF performance, low energy consumption, a wide selection of MCU peripherals, regulatory test certificates for various regions and countries, and a simplified development experience, all in a 6.5 × 6.5 mm package. Together with the certified software stacks and powerful tools also offered by Silicon Labs, the BGM13S minimizes the area requirements, engineering efforts and development costs associated with adding Bluetooth 5.0 or Bluetooth Mesh connectivity to any product, accelerating its time-to-market.

The BGM13S is intended for a broad range of applications, including:

- Wearables
- IoT end-node devices and gateways
- Health, sports, and wellness
- Industrial, home, and building automation
- Beacons
- Smart phone, tablet, and PC accessories

KEY FEATURES

- Bluetooth 5.0 LE compliant
- Fit for Bluetooth Mesh
- Antenna or RF Pin variants
- Up to +18 dBm TX power
- -94.1 dBm RX sensitivity at 1 Mbps
- 32-bit ARM® Cortex®-M4 core at 38.4 MHz
- 512/64 kB of flash/RAM memory
- Autonomous Hardware Crypto Accelerators
- Integrated DC-DC converter
- 32 GPIO pins
- 6.5 mm × 6.5 mm × 1.4 mm



1. Feature List

- **Supported Protocols**
 - Bluetooth 5.0 LE
 - Bluetooth Mesh
- **Wireless System-on-Chip**
 - 2.4 GHz radio
 - TX power up to +18 dBm
 - High Performance 32-bit 38.4 MHz ARM Cortex®-M4 with DSP instruction and floating-point unit for efficient signal processing
 - 512 kB flash program memory
 - 64 kB RAM data memory
 - Embedded Trace Macrocell (ETM) for advanced debugging
 - Integrated DC-DC converter
- **High Receiver Performance**
 - -102.1 dBm sensitivity at 125 kbit/s GFSK
 - -97.9 dBm sensitivity at 500 kbit/s GFSK
 - -94.1 dBm sensitivity at 1 Mbit/s GFSK
 - -90.2 dBm sensitivity at 2 Mbit/s GFSK
- **Low Energy Consumption**
 - 9.7 mA RX current at 1 Mbps, GFSK
 - 8.9 mA TX current at 0 dBm output power
 - 87 µA/MHz in Active Mode (EM0)
 - 1.4 µA EM2 DeepSleep current (full RAM retention and RTCC running from LFXO)
 - 1.14 µA EM3 Stop current (State/RAM retention)
 - Wake on Radio with signal strength detection, preamble pattern detection, frame detection and timeout
- **Regulatory Certifications**
 - FCC
 - CE
 - IC / ISEDC
 - MIC / Telec
- **Wide Operating Range**
 - 1.8 V to 3.8 V single power supply
 - -40 °C to +85 °C
- **Dimensions**
 - 6.5 mm × 6.5 mm × 1.4 mm
- **Support for Internet Security**
 - General Purpose CRC
 - True Random Number Generator (TRNG)
 - 2 × Hardware Cryptographic Accelerators (CRYPTO) for AES 128/256, SHA-1, SHA-2 (SHA-224 and SHA-256) and ECC
- **Wide Selection of MCU Peripherals**
 - 12-bit 1 Msps SAR Analog to Digital Converter (ADC)
 - 2 × Analog Comparator (ACMP)
 - 2 × Digital to Analog Converter (VDAC)
 - 3 × Operational Amplifier (Opamp)
 - Digital to Analog Current Converter (IDAC)
 - Low-Energy Sensor Interface (LESENSE)
 - Multi-channel Capacitive Sense Interface (CSEN)
 - 32 pins connected to analog channels (APORT) shared between analog peripherals
 - 32 General Purpose I/O pins with output state retention and asynchronous interrupts
 - 8 Channel DMA Controller
 - 12 Channel Peripheral Reflex System (PRS)
 - 2 × 16-bit Timer/Counter
 - 3 or 4 Compare/Capture/PWM channels
 - 1 × 32-bit Timer/Counter
 - 3 Compare/Capture/PWM channels
 - 32-bit Real Time Counter and Calendar
 - 16-bit Low Energy Timer for waveform generation
 - 32-bit Ultra Low Energy Timer/Counter for periodic wake-up from any Energy Mode
 - 16-bit Pulse Counter with asynchronous operation
 - 2 × Watchdog Timer
 - 3 × Universal Synchronous/Asynchronous Receiver/Transmitter (UART/SPI/SmartCard (ISO 7816)/IrDA/I²S)
 - Low Energy UART (LEUART™)
 - 2 × I²C interface with SMBus support and address recognition in EM3 Stop