

# ZGM230S Z-Wave SiP Module Data Short



The ZGM230S is a system-in-package (SiP) module for Z-Wave connectivity and networking built for the performance, security, and energy demands of the Smart Home.

Based on the EFR32ZG23 SoC, it delivers robust RF performance, long-range, industry-leading security features, low-current consumption, a rich set of MCU peripherals, ample memory, and a wide operating temperature range, all in a 6.5 x 6.5 mm package.

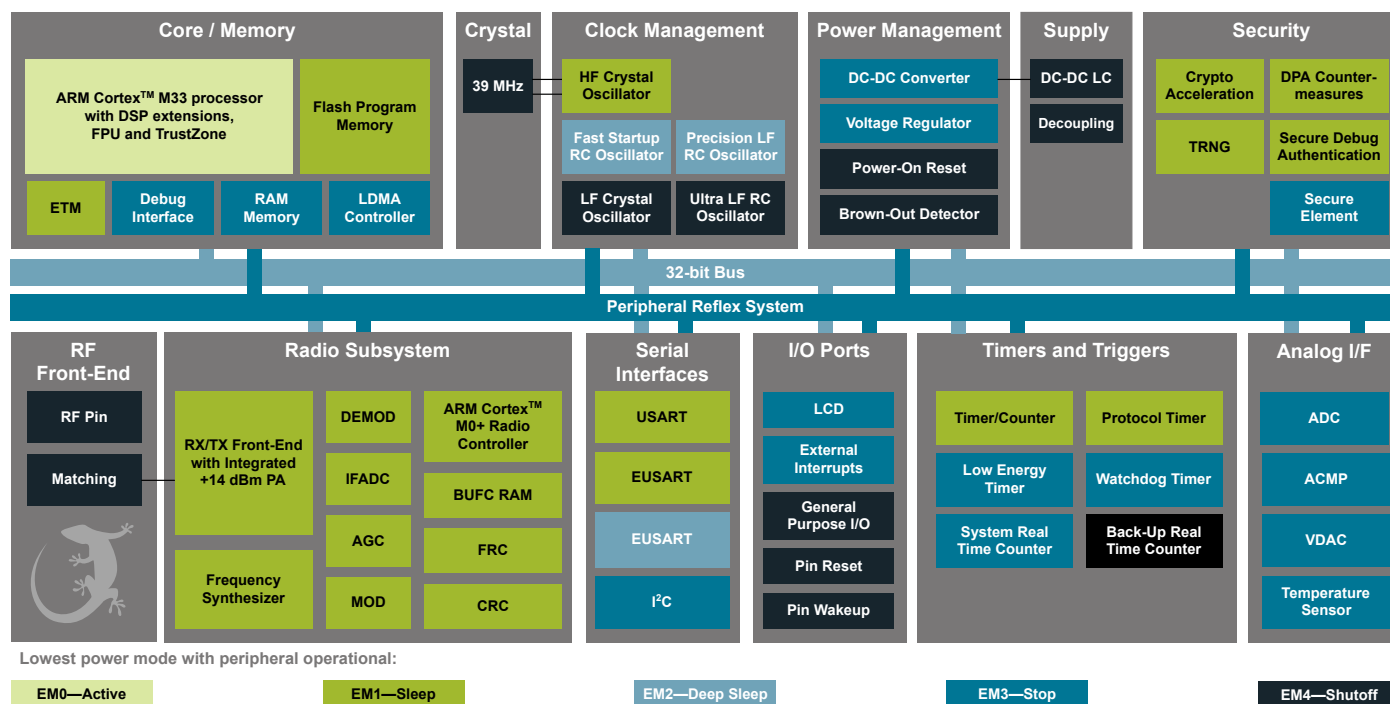
The ZGM230S is a complete solution supported by powerful and fully-upgradeable software, advanced development and debugging tools, and documentation that will simplify and minimize the development cycle, certification process, and deployment of your end-product, helping to accelerate its time-to-market significantly.

The ZGM230S is targeted for a broad range of applications, including:

- Smart Home
- Security
- Lighting
- Building Automation

## KEY FEATURES

- Z-Wave connectivity
- RF pin for external antenna
- +14 dBm TX power
- -110.9 dBm RX sensitivity @100 kbps
- 32-bit ARM Cortex-M33 core at 39 MHz
- 512/64 kB of Flash/RAM memory
- Advanced security features
- Rich set of MCU peripherals
- Integrated DC-DC converter
- Up to 34 GPIO pins
- -40 to 85 °C
- 6.5 mm x 6.5 mm



## 1. Features

- **Supported Protocols**
  - Z-Wave
  - Z-Wave Long Range
- **Wireless System-on-Chip**
  - Sub GHz radio
  - TX power up to +14 dBm
  - 32-bit ARM Cortex<sup>®</sup>-M33 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
- **Receiver Performance**
  - -110 dBm sensitivity at 9.6 kbps FSK, 868 MHz
  - -110 dBm sensitivity at 40 kbps FSK, 868 MHz
  - -108.8 dBm sensitivity at 100 kbps GFSK, 868 MHz
  - -109.4 dBm sensitivity at 9.6 kbps FSK, 915 MHz
  - -109.7 dBm sensitivity at 40 kbps FSK, 915 MHz
  - -108.3 dBm sensitivity at 100 kbps GFSK, 915 MHz
  - -110.9 dBm sensitivity at 100 kbps O-QPSK, 915 MHz
- **Current Consumption**
  - 4.8 mA RX current at 9.6 kbps FSK, 868 MHz
  - 4.8 mA RX current at 100 kbps GFSK, 868 MHz
  - 4.8 mA RX current at 9.6 kbps FSK, 915 MHz
  - 4.8 mA RX current at 100 kbps GFSK, 915 MHz
  - 5.1 mA RX current at 100 kbps O-QPSK, 915 MHz
  - 10.7 mA TX current at 0 dBm, 915 MHz
  - 20.8 mA TX current at +10 dBm, 915 MHz
  - 30.0 mA TX current at +14 dBm, 915 MHz
  - 42  $\mu$ A/MHz in Active Mode (EM0) at 39.0 MHz
  - 0.16  $\mu$ A Shutoff Mode current (EM4)
- **Operating Range**
  - 1.8 to 3.6 V
  - -40 to +85°C
- **Dimensions**
  - 6.5 mm x 6.5 mm
- **Security**
  - 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<sup>®</sup> TrustZone<sup>®</sup>
  - Secure Boot (Root of Trust Secure Loader)
  - Secure Debug Unlock
  - DPA Countermeasures
  - Secure Key Management with PUF
  - Anti-Tamper
  - Secure Attestation
- **MCU Peripherals**
  - 12-bit 1 Msps or 16-bit 76.9 ksps SAR Analog to Digital Converter (ADC)
  - 2  $\times$  Analog Comparator (ACMP)
  - 2  $\times$  Digital to Analog Converter (VDAC)
  - Low-Energy Sensor Interface (LESENSE)
  - Up to 34 General Purpose I/O pins with output state retention and asynchronous interrupts
  - 8 Channel DMA Controller
  - 12 Channel Peripheral Reflex System (PRS)
  - 4  $\times$  16-bit Timer/Counter with 3 Compare/Capture/PWM channels
  - 1  $\times$  32-bit Timer/Counter with 3 Compare/Capture/PWM channels
  - 32-bit Real Time Counter
  - 24-bit Low Energy Timer for waveform generation
  - 2  $\times$  Watchdog Timer
  - 2 $\times$  Enhanced Universal Synchronous/Asynchronous Receiver/Transmitter (EUSART)
  - 1 $\times$  Universal Synchronous/Asynchronous Receiver/Transmitter (UART/SPI/SmartCard (ISO 7816)/IrDA/I<sup>2</sup>S)
  - 2  $\times$  I<sup>2</sup>C interface with SMBus support
  - Integrated Low-Energy LCD Controller supporting up to 80 segments
  - Die temperature sensor

## 2. Ordering Information

**Table 2.1. ZGM230S Ordering Part Numbers**

Ordering Code	Protocol Stack	TX Power	Freq Band	Antenna	Flash (kB)	RAM (kB)	Security	Temp Range	Carrier
ZGM230SA27HGN2	<ul style="list-style-type: none"><li>• Z-Wave</li><li>• Z-Wave Long Range</li></ul>	+14 dBm	Sub GHz	RF pin	512	64	Vault-Mid	-40 to 85 °C	Tray
ZGM230SB27HGN2	<ul style="list-style-type: none"><li>• Z-Wave</li><li>• Z-Wave Long Range</li></ul>	+14 dBm	Sub GHz	RF pin	512	64	Vault-High	-40 to 85 °C	Tray

ZGM230S modules are not pre-programmed with a bootloader.

ZGM230S devices may be referred to by their product family name (ZGM230S) or full ordering code throughout this document.

The **ZWAVE-PK0800A Z-Wave 800 Series Pro Kit** is available for ZGM230S evaluation and development, as well as **ZGM230-RB4205B** radio boards.

# Simplicity Studio

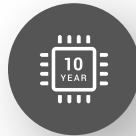
One-click access to MCU and wireless tools, documentation, software, source code libraries & more. Available for Windows, Mac and Linux!



**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., Silicon Laboratories®, Silicon Labs®, SiLabs® and the Silicon Labs logo®, Bluegiga®, Bluegiga Logo®, EFM®, EFM32®, EFR, Ember®, Energy Micro, Energy Micro logo and combinations thereof, "the world's most energy friendly microcontrollers", Redpine Signals®, WiSeConnect, n-Link, ThreadArch®, EZLink®, EZRadio®, EZRadioPRO®, Gecko®, Gecko OS, Gecko OS Studio, Precision32®, Simplicity Studio®, Telegesis, the Telegesis Logo®, USBXpress®, Zentri, the Zentri logo and Zentri DMS, Z-Wave®, 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)

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Silicon Laboratories:

[ZGM230SA27HGN2](#) [ZGM230SA27HGN2R](#) [ZGM230SB27HGN2](#) [ZGM230SB27HGN2R](#)