

ZM5101



General Purpose  
Z-Wave® SiP Module



The ZM5101 combines a Z-Wave SD3502 SoC (with a built-in microcontroller and Z-Wave RF transceiver), crystal, and passive RF components within a single 8mm x 8mm module. This makes the ZM5101 ideal for

small-footprint, single microcontroller products, such as thermostats, remote controls, lighting control, and USB sticks.

The ZM5101 addresses the need for increasingly user-friendly and feature-rich Home Control applications by providing 128kB Flash and 16kB SRAM. The built-in keyscanner and infrared controller are ideal building blocks for implementing a Universal Remote Control that supports both learning and sending IR codes, as well as Z-Wave commands. The ZM5101 provides hardware-assisted frequency agility, enabling the module to switch away from a noisy channel without communication or software overhead. Furthermore the very-low sleep current of the ZM5101 addresses the growing need for longer battery life, allowing existing Z-wave products to experience up to double the battery life of current products.

**KEY BENEFITS**

- Integrated RF module for fastest time-to-market
- High GPIO pin count
- Small form factor: 8mm x 8mm

**TARGET APPLICATIONS**

- Remote controls
- Door locks
- Lighting control
- Thermostats
- Single-chip applications

**KEY FEATURES**

- Integrated CPU and RF transceiver
- 128kB Flash, 16kB SRAM
- 1000 step dimmer (TRIAC/FET)
- 4-channel 12-bit rail-to-rail ADC
- 4-channel 16-bit LED PWM
- 30 GPIOs
- Keyscan controller up to 128keys
- Infrared controller with both RX and TX
- USB full-speed device, SPI, UART, PWM
- Hardware AES 128 security engine
- 1µA sleep mode
- 9.6/40/100 kbit/s data rates
- Regional modules for 868/908/921 MHz
- Hardware-assisted frequency agility with up to 3 channels
- ZM4101 pin-compatible
- Power supply: 2.3-3.6V
- QFN56 8mm x 8mm
- Battery monitor

ACTUAL SIZE  
8mm x 8mm



**POWERING THE NEW DIGITAL HOME:**

SET-TOP BOXES

CONSUMER  
ELECTRONICS

AV NETWORKS

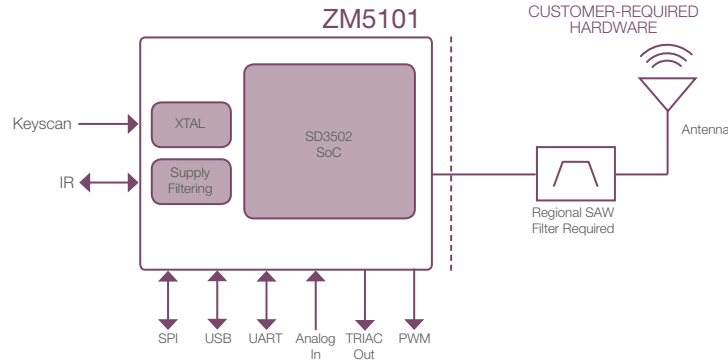
HOME CONTROL

COMMERCIAL  
SYSTEMS



# ZM5101

## General Purpose Z-Wave® SiP Module



MODULE COMPARISON TABLE

	ZM3102	ZM5202	ZM5101	ZM5304
Application	General Purpose	General Purpose	Serial Interface	Modem Only
Type	PCB Module	PCB Module w/ SAW Filter	SIP w/o SAW Filter	PCB Module w/ Ant. & SAW Filter
Based on	SD3301	SD3502	Die	SD3503
Package	PCB Module 13x14mm	PCB Module 13x14mm	QFN56 8x8mm	PCB Module 13x30mm
Frequency (MHz)	868/908/921	868/908/921	868/908/921	868/908/921
Bit-rate (kbit/s)	9.6/40	9.6/40/100	9.6/40/100	9.6/40/100
FLASH Memory (kB)	32	128	128	n/a
SRAM (kB)	2	16	16	n/a
I/O	10	10	30	n/a
Key-Scan (# Keys)	None	None	128	n/a
IR Support	None	None	Transmit/Learn	n/a
UART/SPI	1/1	1/1	2/2	1/-
USB 2.0 Device	None	None	1	1
Security 128-bit AES	Yes SW Only	Yes HW	Yes HW	Yes HW
Tx RF Power (dBm)	-22 to -2	-26 to +2	-24 to +5	-26 to +2 (to antenna)
Rx Sensitivity (dBm)	-102 @ 9.6kbit/s	-103 @ 9.6 kbit/s	-104 @ 9.6kbit/s	-103 @ 9.6kbit/s
Tx/Rx Current (mA)	36(@-2dBm) /23	41(@+2dBm) /32	32(@+3dBm) /32	41(@+2dBm) /32
Sleep Current (µA)	2.5	1	1	2
Battery to Battery (µA)	80	50	50	n/a

### ABOUT SIGMA DESIGNS

Sigma Designs is a leading provider of system-on-chip (SoC) solutions used to deliver entertainment and control throughout the home:

Media Processing, Smart TV, Video Encoding, Home AV Networking, Video Processing, Home Control

These SoCs are supported with board-level reference designs, sophisticated system software, and technical documentation to form a complete solution for a variety of set-top boxes, smart TVs, consumer electronics, AV network devices, and home control systems.

### FOR REGIONAL SALES OFFICES AND DISTRIBUTOR CONTACT INFORMATION

Visit: [www.sigmadesigns.com/sales](http://www.sigmadesigns.com/sales)  
Email: [sales@sigmadesigns.com](mailto:sales@sigmadesigns.com)

Headquarters  
1778 McCarthy Blvd.  
Milpitas, CA 95035  
Main: +1.408.262.9003  
Fax: +1.408.957.9740  
[www.sigmadesigns.com](http://www.sigmadesigns.com)

Features subject to change without notice. Sigma Designs, HiDTV, Z-Wave, and the Sigma Designs logo are either registered trademarks or trademarks of Sigma Designs, Inc. and its subsidiaries in the United States and other countries. All other trademarks or registered trademarks are the property of their respective owners. These devices incorporate copy protection technology that is protected by U.S. patents and other intellectual property rights of Rovi Corporation. Reverse engineering and disassembly are prohibited. Devices that incorporate Rovi Corporation's Anti-Copy Process (ACP) technology may only be sold to Rovi Authorized Buyers. Copyright © 2013 Sigma Designs, Inc. All rights reserved. Rev. 12.18.13 PMB12438

