General Purpose Z-Wave® SiP Module

ZM5101
Z-WAVE 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:

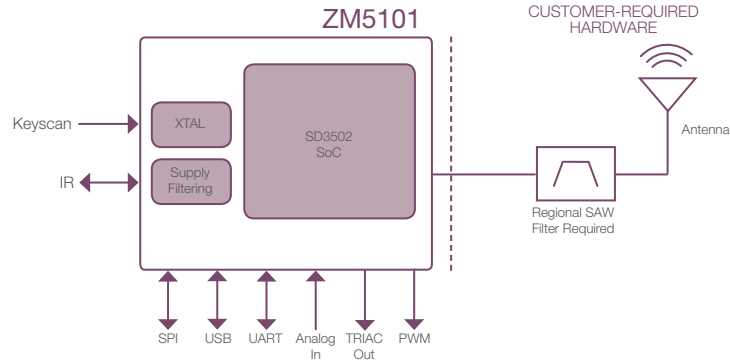SET-TOP BOXES | **CONSUMER ELECTRONICS** | AV NETWORKS | **HOME CONTROL** | COMMERCIAL SYSTEMS

SIGMA
DESIGNS

ZM5101
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MODULE COMPARISON TABLE

Feature	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 (kkbit/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 +4	-24 to +6	-26 to +4
Rx Sensitivity (dBm)	-102 @ 9.6kbit/s	-103 @ 9.6kbit/s	-105 @ 9.6kbit/s	-103 @ 9.6kbit/s
Tx/Rx Current (mA)	36(@ -2dBm) /23	41(@ 0dBm) /32	32(@ 0dBm) /32	36(@ 0dBm) /33
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.

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