SiMG301 Wireless SoC Family Data Short

The SiMG301 SoC family of wireless SoCs for Bluetooth, Matter, Thread, Zigbee, Dynamic Multiprotocol and Concurrent Multiprotocol applications.

The SiMG301 is the next generation Series 3 platform that further extends our leadership in ultra-low power IoT SoCs and modules by enabling the security, compute, RF performance, power efficiency, and low cost required to tap into emerging IoT markets. The multi-core device has an ARM Cortex®-M33 running up to 150 MHz and dedicated cores for the radio and security engine. Our Secure Vault™ High, designed for PSA level 3 certification, helps to protect both the data and the device, while up to 4 MB flash and 512 KB RAM allow for more demanding applications while leaving room for future growth.

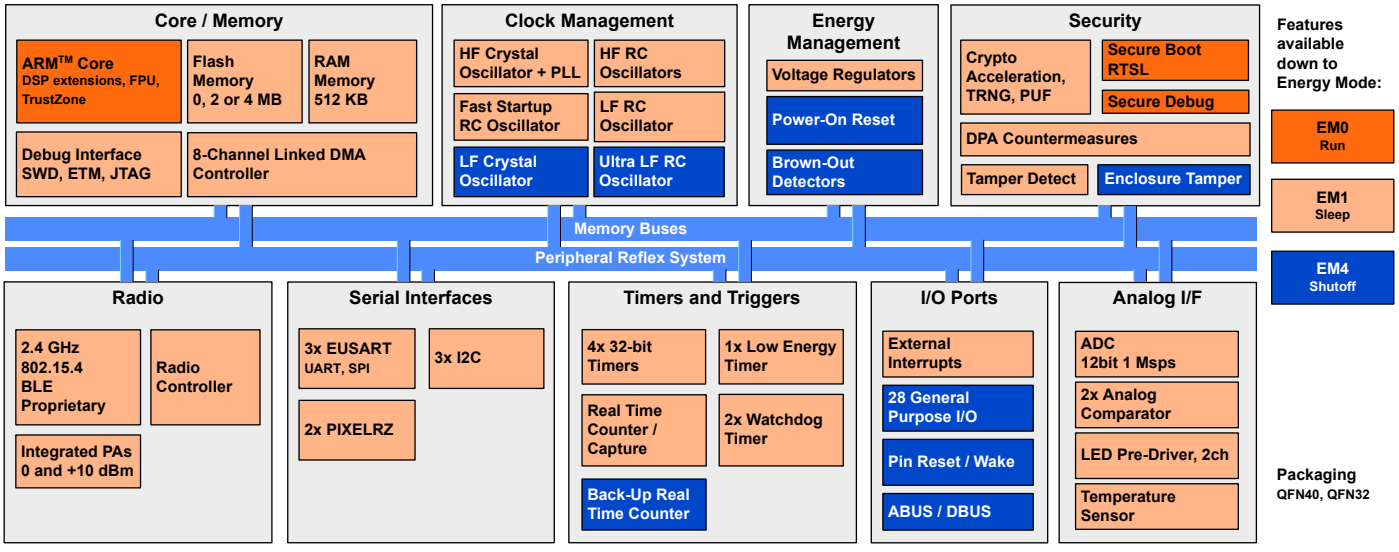
Optimized for LED lighting applications, SiMG301 devices integrate key features including an enhanced PWM for improved LED dimming and control, a PIXELRZ single wire communication interface for LED controller ICs, and a LED pre-driver on select devices, eliminating the need for an LED driver, reducing the BOM, and lowering product cost.

Target applications include the following:

- Smart Lighting - LED Bulbs, LED Fixtures, Luminaires
- Smart Home - Smart Plugs, Switches
- Building Automation - Smart Plugs, Switches

KEY FEATURES

- Optimized for LED lighting applications
- 32-bit ARM M33® core with 150 MHz maximum operating frequency
- Up to 4 MB of flash and 512 KB of RAM
- High-performance radio with up to +10 dBm output power
- Secure Vault™ High
- LED pre-driver
- PIXELRZ interface
- Enhanced PWM



1. Feature List

The SiMG301 highlighted features are listed below.

- **Compute**
  - High Performance 32-bit 150 MHz ARM Cortex-M33® Core with DSP instruction and floating-point unit for efficient signal processing
  - Up to 4 MB co-packaged flash program memory, or external QSPI memory interface with run-time authentication and encryption
  - Up to 512 KB RAM data memory
- **Radio**
  - 2.4 GHz radio operation
  - -106.3 dBm sensitivity @ 250 kbps O-QPSK DSSS
  - -106.8 dBm sensitivity @ 125 kbps GFSK
  - -98.6 dBm sensitivity @ 1 Mbps GFSK
  - -95.7 dBm sensitivity @ 2 Mbps GFSK
  - TX power up to 10 dBm
- **Protocol Support**
  - Matter
  - OpenThread
  - Zigbee
  - Bluetooth Low Energy
  - Bluetooth Mesh
  - Proprietary 2.4 GHz
  - Multiprotocol (DMP and CMP)
- **Supported Modulation Formats**
  - 2 (G)FSK with fully configurable shaping
  - OQPSK DSSS
  - (G)MSK
- **Secure Vault™ High**
  - Hardware Cryptographic Acceleration for AES128/192/256, SHA-1, SHA-2/256/384/512, ECDSA+ECDH(P-192, P-256), Ed25519 and Curve25519, J-PAKE, PBKDF2, SPAKE2+
  - True Random Number Generator (TRNG)
  - ARM® TrustZone®
  - Secure Boot (Root of Trust Secure Loader)
  - Secure Debug Lock/Unlock
  - DPA Countermeasures
  - Secure Key Management with PUF
  - Anti-Tamper
  - Secure Attestation
  - DFA Detection
  - Authenticated XiP (AXiP)
- **Low-Power Peripherals**
  - 12-bit, 1 Msps Analog to Digital Converter (ADC)
  - 2 × Analog Comparator (ACMP)
  - Up to 28 General Purpose I/O pins with output state retention and asynchronous interrupts
  - 8 Channel DMA Controller (LDMA)
  - 16 Channel Peripheral Reflex System (PRS)
  - 2 × 7-channel, 32-bit Timer/Counter with Compare, Capture, and Enhanced PWM capabilities
  - 2 × 3-channel, 32-bit Timer/Counter with Compare, Capture, and Enhanced PWM capabilities
  - 2 × 32-bit Real Time Counter (SYSRTC/BURTC)
  - 24-bit Low Energy Timer for waveform generation (LETIMER)
  - 16-bit Pulse Counter with asynchronous operation (PCNT)
  - 2 × Watchdog Timer (WDOG)
  - 3 × Enhanced Universal Synchronous/Asynchronous Receiver/Transmitter (EUSART) supporting UART/SPI/DALI/IrDA/SmartCard
  - 3 × I^2C interface with SMBus support
  - High-Frequency Crystal Oscillator (HFXO)
  - High-Frequency RC Oscillator (HFRCO)
  - Low-Frequency 32.768 kHz RC Oscillator (LFRCO)
  - Low-Frequency 32.768 kHz Crystal Oscillator (LFXO)
  - 2-channel LED Pre-driver (LEDDRV)
  - 2 × Serial Pixel Interface (PIXELRZ)
  - Die temperature sensor
- **Low Power Consumption**
  - 8.1 mA RX current (1 Mbps 2GFSK, EM1 @ 38.4 MHz)
  - 9.0 mA RX current (250 kbps O-QPSK DSSS, EM1 @ 38.4 MHz)
  - 11.4 mA TX current @ 0 dBm output power (EM1 @ 38.4 MHz)
  - 28.6 mA TX current @ 10 dBm output power (EM1 @ 38.4 MHz)
  - 47 µA/MHz in Active Mode EM0 at 150 MHz
- **Operating Conditions**
  - 1.8 V to 3.63 V single power supply
  - -40 °C to 125 °C
- **Packages**
  - **QFN32** 4 mm × 4 mm × 0.85 mm
  - **QFN40** 5 mm × 5 mm × 0.85 mm

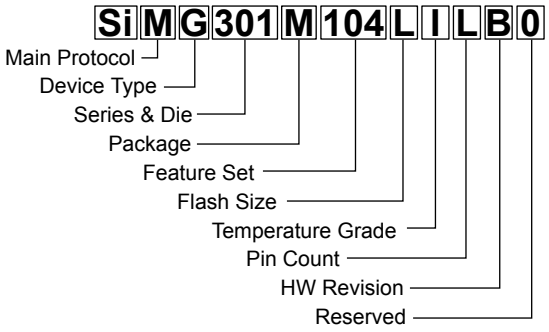
2. Ordering Information

Table 2.1. Ordering Information

Ordering Code	Max TX Power	Flash (KB)	RAM (KB)	GPIO	Package / Pinout	Temp Range
SiMG301M114LIHB0	10	4096	512	17	QFN32 w/ LED Pre-Drive	-40 to 125 °C
SiMG301M113WIHB0	10	3072	384	17	QFN32 w/ LED Pre-Drive	-40 to 125 °C
SiMG301M104LIHB0	10	4096	512	20	QFN32 Max GPIO	-40 to 125 °C
SiMG301M103LIHB0	10	4096	384	20	QFN32 Max GPIO	-40 to 125 °C
SiMG301M114KIHB0	10	2048	512	17	QFN32 w/ LED Pre-Drive	-40 to 125 °C
SiMG301M104XILB0	10	External	512	22	QFN40 w/ External Flash	-40 to 125 °C
SiMG301M104LILB0	10	4096	512	28	QFN40 Max GPIO	-40 to 125 °C

Note:

- 192 KB of flash is reserved for Secure Engine firmware.
- If AXiP feature is used, 11.1% of code space (4 KB of every 36 KB) is reserved for runtime authentication.



Field	Options
Main Protocol	• **M**: 802.15.4, Zigbee, Thread
Device Type	• **G**: System-On-Chip

Series & Die [s1][s2][d1]	• s1, s2
	  • **30**: Series 30
	• d1
	  • **1**: Die Code 1

Package	• **M**: QFN

Feature Set [f1][f2][f3]	• f1
	  • **1**: Reserved
	• f2
	  • **0**: No LED Pre-Driver
	  • **1**: LED Pre-Driver Available
	• f3
	  • **3**: 384 KB RAM
	  • **4**: 512 KB RAM

Flash Size	• **X**: No Flash • **K**: 2 MB Co-Packaged Flash • **L**: 4 MB Co-Packaged Flash
Temperature Grade	• **G**: -40 to 85 °C • **I**: -40 to 125 °C
Pin Count	• **H**: 32 pins • **L**: 40 pins
Hardware Revision	• **B**: Revision B
Reserved	• **0**: Reserved

Figure 2.1. Ordering Code Key

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