

## Product Brief – JN5139

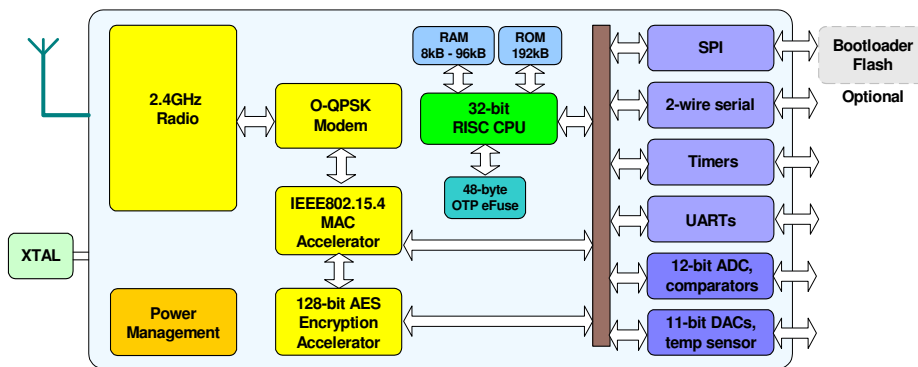
### IEEE802.15.4 and ZigBee Wireless Microcontrollers

#### Overview

The JN5139 is a low power, low cost wireless microcontroller suitable for IEEE802.15.4 and ZigBee applications. Each device integrates a 32-bit RISC processor, with a fully compliant 2.4GHz IEEE802.15.4 transceiver, 192kB of ROM, 96kB RAM and a rich mixture of analogue and digital peripherals.

The cost-sensitive ROM/RAM architecture supports the storage of system software, including protocol stacks, routing tables and application code/data. Each device integrates hardware MAC and AES encryption accelerators, power saving and timed sleep modes, and mechanisms for security key and program code encryption. These features all make for a highly efficient, low power, single chip wireless microcontroller for battery-powered applications.

#### Block Diagram



#### Design Flexibility

##### Benefits

- Single chip integrates transceiver and microcontroller for wireless sensor networks
- Cost sensitive ROM/RAM architecture, meets needs for volume application
- System BOM is low in component count and cost
- Hardware MAC ensures low power consumption and low processor overhead
- Extensive user peripherals
- Pin compatible with JN5121 for easy migration

##### Applications

- Robust and secure low power wireless applications
- Wireless sensor networks, particularly IEEE802.15.4 and ZigBee systems
- Home and commercial building automation
- Remote Controls
- Toys and gaming peripherals
- Industrial systems
- Telemetry and utilities (e.g. AMR)

##### Features: Transceiver

- 2.4GHz IEEE802.15.4 compliant
- 128-bit AES security processor
- MAC accelerator with packet formatting, CRCs, address check, auto-acks, timers
- Integrated power management and sleep oscillator for low power
- On-chip power regulation for 2.2V to 3.6V battery operation
- Deep sleep current 0.2µA
- Sleep current with active sleep timer 1.3µA
- Needs minimum of external components (< US\$1 cost)
- Rx current 34mA
- Tx current 34mA
- Receiver sensitivity -97dBm
- Transmit power +3dBm

##### Features: Microcontroller

- 32-bit RISC processor sustains 32MIPs with low power
- 192kB ROM stores system code, including protocol stack
- 96kB RAM stores system data and optionally bootloaded program code
- 48-byte OTP eFuse, stores MAC ID on-chip, offers AES based code encryption feature
- 4-input 12-bit ADC, 2 11-bit DACs, 2 comparators
- 2 Application timer/counters, 3 system timers
- 2 UARTs (one for debug)
- SPI port with 5 selects
- 2-wire serial interface
- Up to 21 GPIO

**Industrial temperature range**  
(-40°C to +85°C)

**8x8mm 56-lead QFN**

**Lead-free and RoHS compliant**

