

Single-chip solutions optimized for ZigBee® 3.0 and Thread® protocols

NXP® JN5179 Wireless Microcontroller

Ideal for smart home and lighting networks, the JN517x advanced ultra-low-power wireless microcontrollers and modules are designed to speed up the creation of smarter, more secure and more energy-efficient systems.

KEY IC FEATURES

- ▶ ZigBee 3.0 and Thread support
- ▶ 2.4 GHz IEEE® 802.15.4-compliant radio
- ▶ 128-bit AES security processor
- ▶ MAC accelerator with packet formatting, CRCs, address check, auto-acks, timers
- ▶ Integrated ultra-low-power sleep oscillator (0.7 μ A)
- ▶ 2.0 V to 3.6 V battery operation
- ▶ Deep-sleep current: 130 nA (wake-up from external event)
- ▶ Low external component cost
- ▶ Compensation for temperature drift of crystal frequency
- ▶ Receive current: 12.7 mA; receiver sensitivity: -96 dBm
- ▶ Configurable transmit power, for example:
 - 10 dBm, 22.5 mA
 - 8.5 dBm, 19.6 mA
 - 3 dBm, 14 mA
- ▶ Radio link budget 106 dB
- ▶ CPU based on the ARM® Cortex®-M3 core, clock speed up to 32 MHz
- ▶ 512 KB flash, 32 KB RAM and 4 KB EEPROM
- ▶ 2-wire I²C-bus serial interface (master or slave)
- ▶ Antenna diversity (Auto Rx)
- ▶ Eight (8) timers, (six (6) PWM and two (2) timer/counters)
- ▶ Two (2) programmable sleep timers
- ▶ Two (2) UARTs

- ▶ SPI-bus master and slave port, two simultaneous selects
- ▶ Voltage brownout with eight programmable thresholds
- ▶ 6-input 10-bit ADC, comparator
- ▶ Battery and temperature sensors
- ▶ Watchdog timer and POR
- ▶ Up to 18 digital I/O and two (2) digital output pins
- ▶ Temp range: -40 °C to +125 °C

KEY IC BENEFITS

- ▶ Single-chip device runs stack and application
- ▶ Very low-current solution for long battery life (>10 years)
- ▶ Supports multiple network stacks
- ▶ Highly featured CPU based on the Cortex-M3 core for high performance and low power

KEY MODULE BENEFITS

- ▶ Provide quick time-to-market
- ▶ Minimize product development time and cost
- ▶ Meet worldwide regulatory requirements for IEEE 802.15.4 at 2.4 GHz
- ▶ No RF test required: Integrating printed and/or uFL antenna



KEY APPLICATIONS

- ▶ Internet of Things (IoT)
- ▶ Home and building automation
- ▶ Smart lighting networks
- ▶ Energy harvesting (e.g., self-powered light switch)
- ▶ Wireless sensor networks

JN517x WIRELESS MICROCONTROLLERS

The JN517x family consists of low-power, high-performance wireless microcontrollers and modules, optimized as platforms for Thread and ZigBee 3.0 applications in smart home and lighting mesh networks.

All the JN517x microcontrollers feature a processor built on the Cortex-M3 core with debug and programmable clock speeds. JN517x devices have up to 512 KB of embedded flash memory as well as 32 KB of RAM and 4 KB of EEPROM. The embedded flash memory can support “over-the-air” firmware updates. The device also includes a 2.4 GHz IEEE802.15.4 compliant transceiver and a comprehensive mix of on-chip analog and digital peripherals.

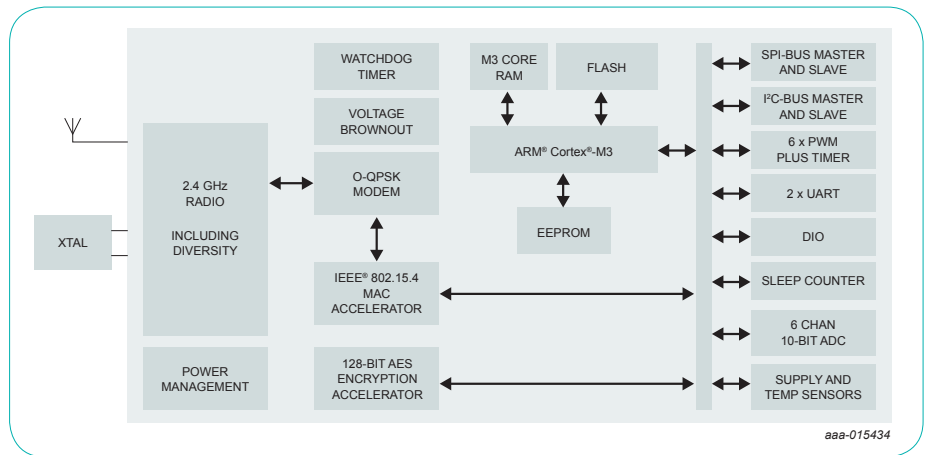
The radio transmit power is configurable up to +10 dBm output. This configuration ability greatly extends operating range and thus improves connectivity. The very-low receive operating current (down to 12.7 mA in normal operation and 0.6 µA in sleep mode) results in long battery life, allowing operation directly from a coin cell.

The on-chip peripherals include a fail-safe I²C-bus, SPI-bus ports (both master and slave), a 6-channel analog-to-digital converter with a battery monitor, and a temperature sensor, directly supporting a wide range of applications without the need for extra hardware.

JN5179 WIRELESS MODULES

The JN5179-001-M1x (where x = 0, 3 or 6) module family provides designers with ready-made components, based on the JN5179 microcontroller, to act as fully integrated platforms for

JN517x BLOCK DIAGRAM



applications operating on the IEEE 802.15.4 standard in the 2.4-to-2.5 GHz ISM frequency band.

These include ZigBee 3.0 and Thread applications for markets such as smart lighting and home automation. The modules allow these solutions to be quickly and easily integrated into product designs. They include all of the required RF components for product development, removing the need to perform expensive RF design and testing. Products can be designed by simply connecting sensors and switches to the module I/O pins.

Using the JN5179 single-chip IEEE802.15.4 wireless microcontroller allows designers to benefit from NXP's extensive range of support materials for this chip.

All the modules have FCC modular approval. The JN5179-001-M10 and JN5179-001-M13 are also CE-compliant and subject to a Notified Body Opinion.

SUPPORT RESOURCES

Comprehensive support resources are available for JN517x products and associated networking protocols, including software development kits, application notes and user guides. These resources are available free-of-charge from the Wireless Connectivity area of the NXP website, www.nxp.com.

JN517x FAMILY COMPARISON

	Tx Power	Tx Current	Rx Sensitivity	Rx Current	Flash	RAM	EEPROM
JN5174	+10 dBm	22.5 mA	-96 dBm	12.7 mA	160 KB	32 KB	4 KB
JN5178	+10 dBm	22.5 mA	-96 dBm	12.7 mA	256 KB	32 KB	4 KB
JN5179	+10 dBm	22.5 mA	-96 dBm	12.7 mA	512 KB	32 KB	4 KB

JN5179 MODULE FAMILY COMPARISON

	Antenna	Tx Power	Tx Current	Rx Sensitivity	Rx Current	Flash/RAM	Size
JN5179-001-M10	Printed antenna	10 dBm	22.5 mA	-95.5 dBm	12.7 mA	512 KB / 32 KB	14.5 x 20.5 mm
JN5179-001-M13	uFl connector	10 dBm	22.5 mA	-95.5 dBm	12.7 mA	512 KB / 32 KB	14.5 x 20.5 mm
JN5179-001-M16	Printed antenna and uFl connector	20 dBm	114 mA	-100 dBm	21.4 mA	512 KB / 32 KB	14.5 x 20.5 mm

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