NXP wireless microcontrollers & modules JN516x

Single-chip solutions for ZigBee, JenNet-IP & IEEE802.15.4 apps

These advanced chips and modules provide a low-power, high-performance solution for systems running ZigBee, JenNet-IP, or IEEE802.15.4

Key features

- 2.4 GHz IEEE802.15.4-compliant radio
- 128-bit AES security processor
- MAC accelerator with packet formatting, CRCs, address check, auto-acks, timers
- Integrated ultra-low-power sleep oscillator (0.5 µA)
- 2.0 to 3.6 V battery operation
- Deep-sleep current: 0.12 µA (wake-up from I/O)
- Low external component cost (less than US$ 0.15)
- Rx current: 17 mA , Tx: 15 mA
- Receiver sensitivity: -95 dBm
- Transmit power: 2.5 dBm
- Time of Flight engine for ranging
- 32-bit RISC CPU, clock speed up to 32 MHz
- Variable instruction width for high coding efficiency
- Multi-stage instruction pipeline
- RF4CE, JenNet-IP, ZigBee PRO stacks
- 2-wire I^2C serial interface (master or slave)
- Five PWMs (Four timers, one timer/counter)
- Two low-power sleep counters
- Two UARTs
- SPI master and slave port, three selects
- Voltage brownout with eight programmable thresholds
- 4-input 10-bit ADC, comparator
- Battery and temperature sensors
- Watchdog timer and POR
- Up to 20 digital I/O
- Temp range: -40 to +125 °C

Key benefits

- Single-chip device runs stack and application
- Very low-current solution for long battery life (10+ yrs)
- Supports several different network stacks
- Highly featured 32-bit RISC CPU for high performance and low power

Applications

- "Internet of Things"
- JenNet-IP
- ZigBee LightLink
- ZigBee Smart Energy
- RF4CE
- Home and building automation
- Smart lighting
- Remote controls
- Smart energy
- Wireless sensor networks

The NXP JN516x series is a range of ultra-low-power, high-performance wireless microcontrollers suitable for JenNet-IP, remote control, IEEE802.15.4, and ZigBee applications.

The series features an enhanced 32-bit RISC processor with embedded Flash and EEPROM memory that offers high coding efficiency through variable width instructions, a multi-stage instruction pipeline and low-power operation with programmable clock speeds.

The series also includes a 2.4 GHz, IEEE802.15.4-compliant transceiver plus a comprehensive mix of analog and digital peripherals. Three memory configurations are available to suit different applications.

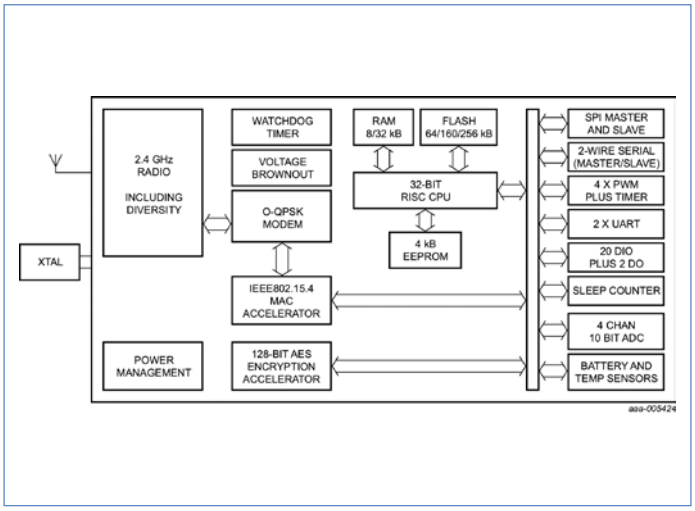
The best-in-class operating current (below 17 mA) and the 0.5 uA sleep timer mode extend battery life and support operation direct from a coin cell.

The on-chip peripherals support a wide range of applications. They include a 2-wire I²C port, an SPI port that can operate as either master or slave, a four-channel ADC with battery monitor and temperature sensor. Each device can support a large switch matrix of up to 100 elements or a 20-key capacitive touch pad.

These devices are available as a range of chips with three different memory sizes and also as a range of modules based on the largest memory variant, the JN5168. The JN5161-001, with 64 kB flash and 8 kB RAM, is suitable for RF4CE and IEEE802.15.4 applications. The JN5164-001, with 160 kB flash and 32kB RAM is suitable for JenNet-IP and some ZigBee applications. The JN5168-001, with 256 kB flash and 32 kB RAM, is suitable for all applications.

There are four modules: the JN5168-001-M00 (printed antenna), the JN5168-001-M03 (µFl connector), the JN5168-001-M05 (10 dBm power amplifier for use in Europe and Asia), and the JN5168-001-M06 (20 dBm power amplifier for use in the US). Modules are qualified from -40 to +85 °C.

JN516x block diagram



JN516x chip memory specifications

	Flash	RAM	EEPROM
JN5161	64 kB	8 kB	4 kB
JN5164	160 kB	32 kB	4 kB
JN5168	256 kB	32 kB	4 kB

JN516x module specifications

	Antenna	Tx power	Rx sensitivity	Tx current	Rx current	Size
JN5168-001-M00	Printed antenna	+2.5 dBm	-95 dBm	15 mA	17 mA	16 x 30 mm
JN5168-001-M03	µFl connector	+2.5 dBm	-95 dBm	15 mA	17 mA	16 x 21 mm
JN5168-001-M05	µFl connector 10 dBm ETSI mode	+9.5 dBm	-96 dBm	35 mA	22 mA	16 x 30 mm
JN5168-001-M06	µFL connector 20 dBm FCC mode	+22 dBm	-100 dBm	175 mA	22 mA	16 x 30 mm

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