For ZigBee® 3.0 Smart Home and Lighting mesh networks with NFC

NXP® JN517x-DK005 Development Kit for ZigBee 3.0

This kit simplifies and speeds up the development of systems that employ the ZigBee 3.0 mesh networking stack, and facilitates easy and secure near-field communication (NFC) commissioning for fast, user-friendly installation.

KEY FEATURES

▶ Raspberry Pi® 2 single-board computer

▶ Two carrier boards with integrated NFC tags (NT3H2111–I²C+)

▶ Two expansion boards with lights, sensors and buttons

▶ Four JN5179 wireless modules

▶ Two JN5179 USB dongles

▶ NFC reader expansion board for Raspberry Pi

▶ Wi-Fi® dongle compatible with Raspberry Pi

▶ Compatible software development kits (SDKs) with:
   – GNU-based toolchain with C compiler
   – Flash programmer
   – Eclipse IDE
   – Microcontroller and peripheral libraries

KEY BENEFITS

▶ Quick and easy product development

▶ Integrated secure NFC commissioning software and hardware

▶ Free, unrestricted Eclipse-based SDK

▶ Hardware platforms provide sensors, LEDs and switches for application development

KEY APPLICATIONS

▶ Internet of Things (IoT) devices

▶ ZigBee 3.0 devices

▶ Thread® end devices

▶ Home and building automation

▶ Smart lighting

▶ Remote controls

▶ Wireless sensor networks

The NXP JN517x-DK005 development kit provides a hardware platform for rapid product development based around JN517x ultra-low-power, high-performance wireless microcontrollers. It is an ideal environment for developing home automation and smart lighting applications that use the ZigBee 3.0 wireless networking protocol.

This comprehensive kit includes JN5179 wireless modules, carrier boards, plug-in expansion boards, JN5179 USB dongles and a Raspberry Pi 2 single-board computer with programmed microSD® card and compatible Wi-Fi adaptor. Comprehensive software development kits support the JN5179 package and provide everything necessary for system development.

The supplied Raspberry Pi single-board computer, which runs the NXP OpenWRT firmware, hosts a gateway that provides access to sensor-equipped wireless nodes forming part of the IoT. An NFC expansion board also allows the Raspberry Pi computer to provide a base for the NFC commissioning of wireless nodes.

Thanks to the pre-loaded smart home demonstration based on a ZigBee 3.0 application, users can quickly deploy a simple wireless network using the kit components.

Example applications for wireless nodes are available in application notes from the Wireless Connectivity area of the NXP web site (www.nxp.com), allowing designers to rapidly produce demonstrators or proof-of-concept products. The same software can then be used for end products, using JN517x ICs or modules.

The kit also includes a network sniffer license from Ubilogix®, free for use for 45 days. The network sniffer runs on one of the supplied JN5179 USB dongles.

The kit can be easily expanded by purchasing additional nodes available in the two kits:

‣ JN517x-XK030 Generic Node Expansion Kit

‣ JN517x-XK040 Lighting/Sensor Node Expansion Kit

JN517x WIRELESS MICROCONTROLLER BLOCK DIAGRAM

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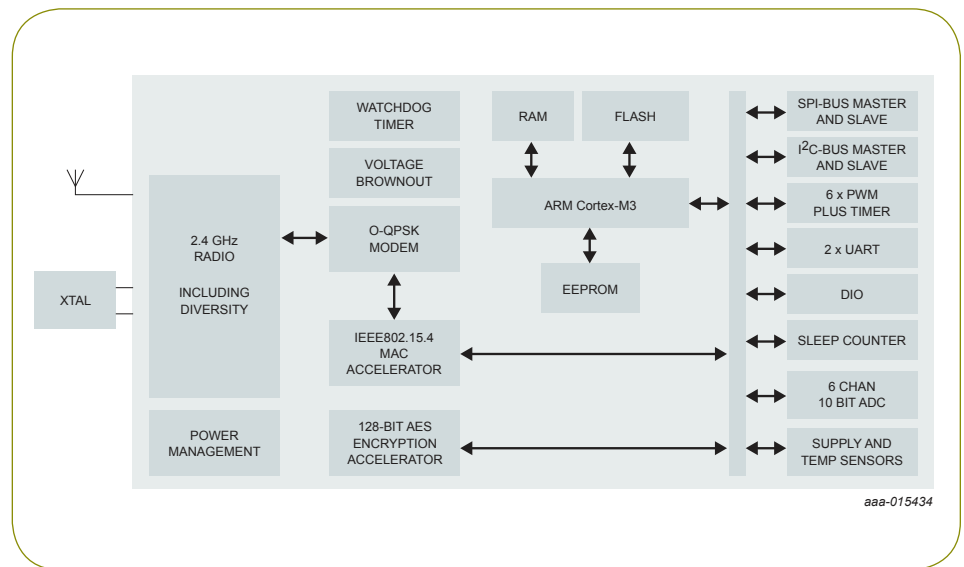
JN517x Wireless Microcontrollers

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 smart lighting mesh networks.

All the JN517x microcontrollers feature an ARM® Cortex®-M3 processor with debug and programmable clock speeds. The 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 transmission power output greatly extends operating range and thus improves the robustness of 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. Through its power-saving modes, the device is therefore ideal for battery-powered nodes.

The on-chip peripherals include a fail-safe I²C-bus, SPI-bus ports (both master and slave) and 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.