NXP evaluation kit JN5169-EK004

Easy development of ZigBee & IEEE 802.15.4 applications with NFC

Providing all the hardware and software components for full application design, this kit simplifies development for systems running ZigBee and IEEE 802.15.4 network stacks, and enables easy, secure NFC commissioning for faster, simpler installations.

KEY FEATURES

▸ Two carrier boards with integrated NFC tag (NT3H1101)
▸ NFC reader expansion board for Raspberry Pi
▸ Two expansion boards with sensors and buttons
▸ Two JN5169 USB dongles
▸ One Wi-Fi dongle compatible with Raspberry Pi
▸ Complete software development kit (SDK)
  - 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 SW and HW
▸ Free, unrestricted Eclipse-based SDK
▸ Hardware platform supports all sensors, displays, LEDs, switches

KEY APPLICATIONS

▸ Internet of Things (IoT)
▸ ZigBee LightLink (LL)

▸ ZigBee home automation
▸ Home and building automation
▸ Smart lighting
▸ Remote controls
▸ Wireless sensor networks

The NXP JN5169-EK004 evaluation kit is specifically designed for use with the NXP JN516x series, a range of ultra-low-power, high-performance wireless microcontrollers suitable for home-automation and smart-lighting applications. This comprehensive kit – which includes a series of wireless carrier boards, plug-in expansion boards, USB dongles, remote control, Raspberry Pi single board computer (with programmed micro-SDcard acting as a border-router), and a complete software design kit – provides everything necessary for system development.

The supplied Raspberry Pi single-board computer, which runs NXP OpenWRT firmware, makes it easy to develop solutions that include sensor-equipped objects as part of the Internet of Things (IoT).

Thanks to the pre-loaded Smart Home Demonstration, based on a ZigBee PRO Home Automation application, designers can quickly produce demonstrators or proof-of-concept products. The same software can then be used for end products, using JN5169 ICs or modules. Moreover, the evaluation kit supports the ZigBee Light Link and Home Automation profiles, as well as pure IEEE802.15.4 applications. Descriptions and examples of these protocols/profiles are available in Application Notes from the NXP Wireless Connectivity TechZone (www.nxp.com/techzones/wireless-connectivity/overview.html).

The kit also includes a network sniffer license from Ubilogix, free for use for 45 days, plus a JTAG extension board. The network sniffer works with the second USB dongle as the primary device. The JTAG expansion board is compatible with the Beyond® Semiconductor debug probe, which can be purchased separately at www.beyondsemi.com/beyond-debug-key.

The JN5169-EK004 evaluation kit can be ordered using the reference JN5169HA/EVAL1. Expansion nodes are available in two kits, the JN516x-XK010 ZigBee Generic Node Expansion Kit and the JN516x-XK020 ZigBee Lighting/Sensor Node Expansion Kit.

JN5169 WIRELESS MICROCONTROLLER
The JN5169 is an ultra-low-power, high-performance wireless microcontroller suitable for ZigBee applications. It features 512 kB embedded Flash, 32 kB RAM and 4 kB EEPROM memory, allowing OTA upgrade capability without external memory. The 32-bit RISC processor offers high coding efficiency through variable width instructions, a multi-stage instruction pipeline and low-power operation with programmable clock speeds. It also includes a 2.4 GHz IEEE 802.15.4-compliant transceiver and a comprehensive mix of analog and digital peripherals. The best-in-class Rx operating current (down to 13 mA and with a 0.7 μA sleep timer mode) gives excellent battery life and allows direct operation from a coin cell. It integrates a 10 dBm power amplifier, which greatly extends the operating range of the device and thereby improves the robustness of the connectivity.
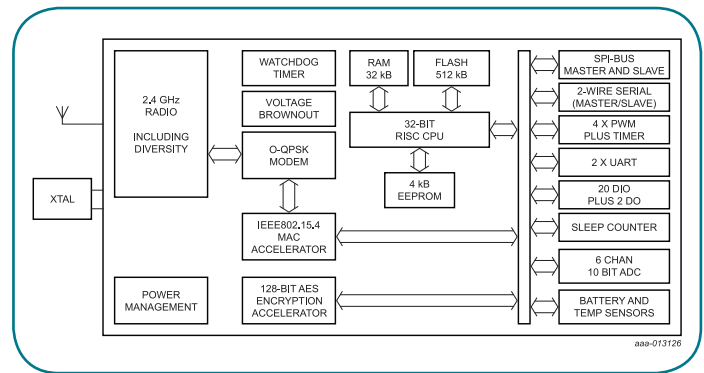
JN5169 block diagram

JN5169-EK004 KIT CONTENTS
▶ Raspberry Pi single-board computer with programmed micro-SDcard (to act as border-router) and microSD adaptor
▶ 5 V DC power supply unit (universal type) for Raspberry Pi RJ45 Ethernet cable for Linksys router
▶ 12 V DC power supply unit (universal type) for carrier boards
▶ RJ45 Ethernet cable
▶ USB Wi-Fi dongle compatible with Raspberry Pi
▶ NFC reader PN7120 expansion board for Raspberry Pi
▶ Two JN5169 USB dongles with integrated antenna
▶ Two JN5169 standard-power modules with integrated antenna (both pre-fitted to Carrier Boards)
▶ Two generic Expansion Boards
▶ JTAG Expansion Board
▶ Two carrier boards containing NFC tag NT3H1101
  - one pre-fitted with Generic Expansion Board and JN5169 module with integrated antenna
  - one pre-fitted with Lighting/Sensor Expansion Board and JN5169 module with integrated antenna
▶ 5-way 2.1 mm daisy-chain power-extender cable
▶ USB-to-USB extension cable
▶ Two USB-A-to-Mini-B cables
▶ USB to Micro USB cable (for supplying Raspberry Pi)
▶ 9 packs of AAA batteries