

## Product Brief – JN5121-xxx-Myy

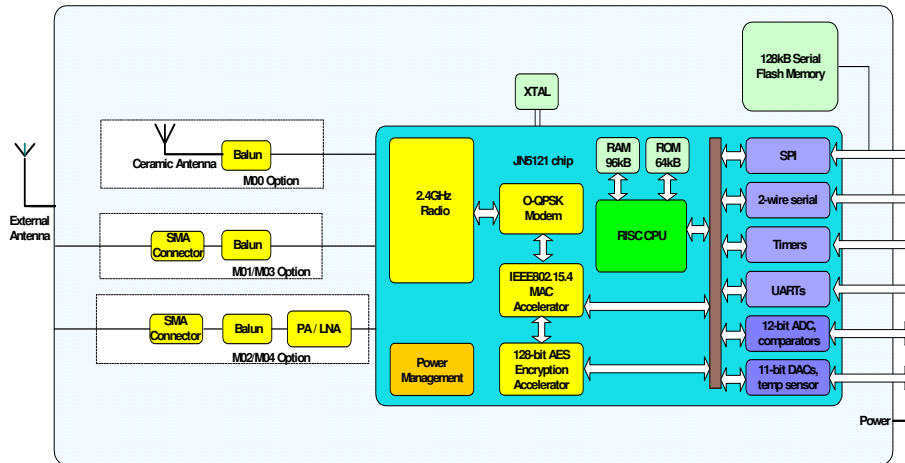
### IEEE802.15.4/ZigBee Module Family

#### Overview

The JN5121-xxx-Myy is a family of surface mounted modules that enable users to implement IEEE802.15.4 or ZigBee compliant systems with minimum time to market and at the lowest cost. They remove the need for expensive and lengthy development of custom RF board designs and test suites. The modules use Jennic's JN5121 wireless microcontroller to provide a comprehensive solution, including all RF components. All that is required to develop and manufacture wireless control or sensing products is to connect a power supply and peripherals such as switches, actuators, sensors, considerably simplifying product development.

Three basic hardware module variants are available: JN5121-xxx-M00 with an integrated antenna, JN5121-xxx-M01/M03 with an antenna connector and JN5121-xxx-M02/M04 with a power amplifier and LNA for extended range. Each of these can be provided pre-programmed with a ZigBee network stack (JN5121-Z01-Myy).

#### High Power Module Block Diagram



#### Benefits

- Microminiature module solutions
- Ready to use in products
- Minimises product development time
- No RF test required for systems
- Compliant with FCC part 15 rules, ETSI ETS 300-328 and Japan ARIB STD-T66
- Production volumes supplied pre-programmed with application software

#### Applications

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

#### Features: Module

- 2.4GHz IEEE802.15.4 compliant
- 2.7-3.6V operation
- Sleep current (with active sleep timer) < 14µA
- **JN5121-xxx-M00/01/03**  
Standard module, 0dBm power  
M00: on board antenna or  
M01: SMA connector,  
M03: RP-SMA connector  
up to 400m range
  - Receiver sensitivity -90dBm
  - TX current < 45mA
  - RX current < 50mA
  - 18x30mm
- **JN5121-xxx-M02/04**  
18.5dBm power with LNA and  
SMA connector, up to 4km  
range
  - Receiver sensitivity -93dBm
  - TX current < 120mA
  - RX current < 55mA
  - 18x41mm

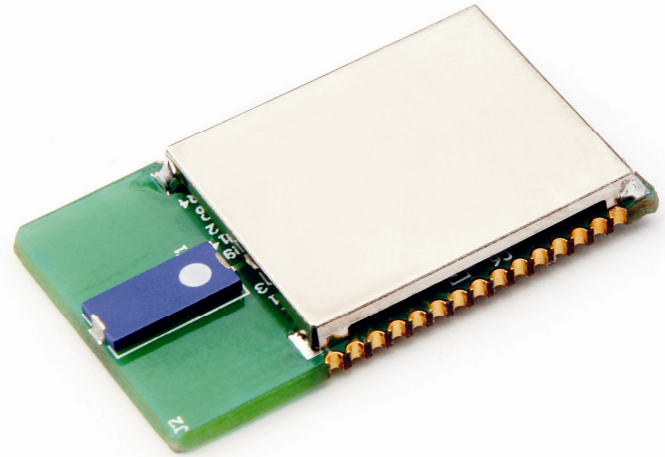
#### Features: Microcontroller

- 16MHz 32-bit RISC CPU
- 96kB RAM, 64kB ROM
- 4-input 12-bit ADC, 2 11-bit DACs, comparator, temperature sensor
- 2 Application timer/counters, 3 system timers
- 2 UARTs (one for in-system debug)
- SPI port with 5 selects
- 2-wire serial interface
- 21 GPIO
- Evaluation kits available with full, unlimited, Software Development Kit

**Industrial temperature range**  
(-20°C to +70°C)

**Lead-free and RoHS compliant**

These modules are based on Jennic's JN5121 low power, low cost IEEE802.15.4 compliant wireless microcontroller. This device combines an on chip 32-bit RISC core, a fully compliant 2.4GHz IEEE802.15.4 transceiver, 64kB of ROM and 96kB of RAM and provides a versatile low cost solution for wireless sensor networking applications. The high level of integration helps to reduce the overall system cost. In particular, the ROM enables integration of point-to-point and mesh network stack protocols, and the RAM allows support of router and controller functions, as well as the application, without the need for additional external memory. The JN5121 uses hardware MAC and highly secure AES encryption accelerators for low power and minimum processor overhead. Integrated sleep oscillator and power saving facilities are provided, giving low system power consumption. The device also incorporates a wide range of digital and analogue peripherals for the user to connect to their application.



**JN5121-M00-M01**

## Evaluation Kits

Jennic provides a full evaluation kit to enable the user to quickly, easily and effectively develop applications for wireless sensor networks. The evaluation kit allows development of applications using Mesh network stacks and includes a controller board, four sensor boards and an RS-232 interface cable to the PC-based development tools. Applications developed using these kits can be directly downloaded onto the modules, providing a simple two step route to volume production.

A Software Developer Kit (SDK), free from Jennic's website, provides a comprehensive suite of tools to facilitate the development of application code. The kit includes a C compiler, graphical and text debuggers, assembler/linker and flash programmer.

Libraries are included with the SDK that drive the peripherals of the JN5121 wireless microcontroller. It enables applications to call library functions via a simple Application Programming Interface (API). Applications developed on this kit can be directly loaded onto the module memory to implement production solutions.

## Wireless Protocol Stacks

A library is provided as standard for an IEEE802.15.4 compliant protocol stack suitable for point-to-point, star or tree networks. Libraries are also available for mesh network stacks such as ZigBee and IPv6.

## Radio Standards Compliance

Jennic modules are designed and manufactured to ISO9001 quality standards. Our modules are also tested and qualified to worldwide government agency radio standards, which allows products using our modules to inherit the same approvals.