Jennic
TECHNOLOGY FOR A CHANGING WORLD

Product Brief – JN5139-xxx-Myy
IEEE802.15.4/ZigBee Module Family

Overview

The JN5139-xxx-Myy family is a range of surface mount modules that enables 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 JN5139 wireless microcontroller to provide a comprehensive solution with high radio performance and all RF components included. 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 and sensors, considerably simplifying product development.

Five hardware module variants are available: JN5139-xxx-M00 with an integrated antenna, JN5139-xxx-M01/M03 with an antenna connector and JN5139-xxx-M02/M04 with a power amplifier and LNA for extended range. Each variant can be provided pre-programmed with a ZigBee network stack (JN5139-Z01-Myy).

Module Block Diagram
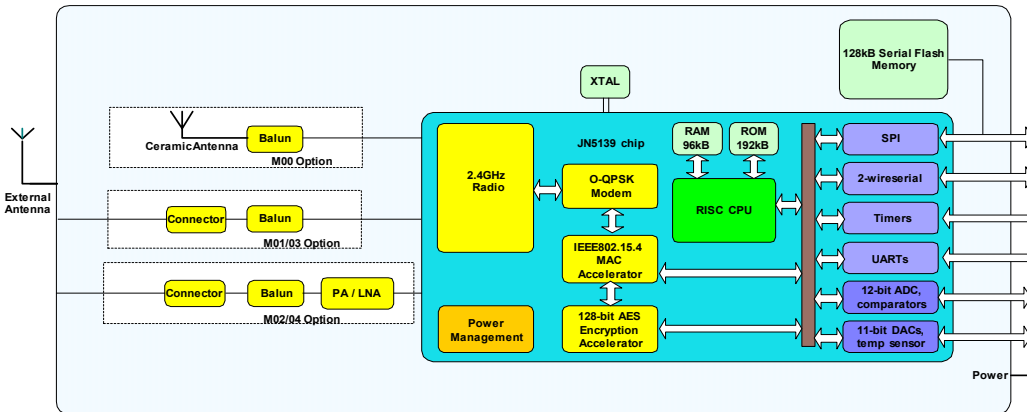
Benefits

- 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 & ZigBee compliant
- 2.7-3.6V operation
- Sleep current (with active sleep timer) 2.8µA
- **JN5139-xxx-M00/01/03**
  up to 1km range
  M00: on board antenna
  M01: SMA connector
  M03: uFl connector
  - Receiver sensitivity -96.5dBm
  - TX power +2.5dBm
  - TX current 37mA
  - RX current 37mA
  - 18x30mm
- **JN5139-xxx-M02/04**
  up to 4km range
  M02: SMA connector
  M04: uFl connector
  - Receiver sensitivity -100dBm
  - TX power +19dBm
 - TX current 120mA
  - RX current 45mA
  - 18x41mm

Features: Microcontroller

- 16MHz 32-bit RISC CPU
- 96kB RAM, 192kB ROM
- 4-input 12-bit ADC, 2 11-bit DACs, 2 comparators, 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

Temperature range
-20°C to +70°C

Lead-free and RoHS compliant

These modules are based on Jennic's JN5139 low power, low cost IEEE802.15.4 compliant wireless microcontroller. This device combines an on chip 32-bit RISC core, a high performance 2.4GHz IEEE802.15.4 transceiver, 192kB 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 JN5139 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.
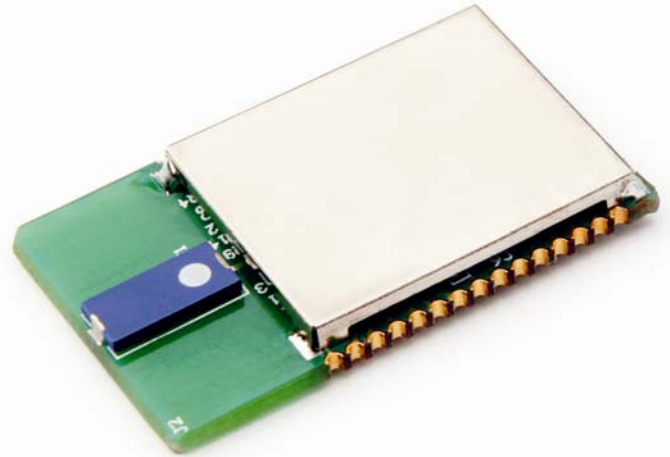
JN5139-000-M00

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 a USB 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 Integrated Development Environment (IDE) to facilitate the development of application code. The kit includes a C compiler, graphical and command-line debuggers, assembler/linker and flash programmer.

Libraries are included with the SDK that drive the peripherals of the JN5139 wireless microcontroller. They enable 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. The modules are also tested and qualified to worldwide government agency radio standards, which allows products using our modules to inherit the same approvals.