Press Release

Jennic Launches Industry’s First Complete IP Portfolio for 2.4GHz IEEE802.15.4 Compliant and ZigBee™ Wireless Products

SHEFFIELD, UK – February 17th, 2004 – Jennic, a leading supplier of system-level intellectual property (IP) cores and silicon design services announced today the availability of the industry’s first complete suite of intellectual property (IP) cores and products for 2.4GHz IEEE802.15.4-compliant and ZigBee™ wireless products. Jennic’s 802.15.4 IP portfolio enables a range of IC products providing robust, secure, wireless transmission with long battery life to serve a wide range of applications, including residential and industrial control, personal health care, computer/gaming peripherals and consumer electronics.

The suite of IP cores comprises a 2.4GHz IEEE802.15.4-compliant radio in 0.18µm RFCMOS, an O-QPSK modem, a baseband controller and a MAC protocol stack. These cores can be integrated to allow semiconductor vendors or system-OEMs to address the emerging IEEE802.15.4 / ZigBee market quickly and with minimum cost and risk, or they can be combined with a customer’s IP (such as a processor or radio) to produce customer-defined products.

“There are tremendous opportunities in adding standards-based wireless systems to both mature and emerging industrial and home markets,” said Jim Lindop, CEO, Jennic Ltd. “Jennic’s IEEE802.15.4 and ZigBee wireless technology will enable our customers to exploit these markets with industry-leading products in a timely, cost-effective manner.”

Jennic will also integrate the cores to provide IP chip level products to suit a range of applications from lowest-cost, single-chip systems to high-performance transceivers. Complete system-on-chip devices, with integrated transceiver, processor and peripherals may be developed providing the lowest possible bill-of-materials and lowest power consumption, leading to several years of life from one battery. Evaluation boards and a software developers kit will be available to provide fast and convenient application development.
Single Chip IEEE802.15.4 Product

The source code and manufacturing packages of the IP cores and products can be licensed from Jennic by semiconductor or System-OEM customers. Jennic will also provide design services to create standards-based or proprietary customer-specific products by modifying the IP, adding customer IP, implementing in silicon, developing software applications and providing support.

Jennic’s 2.4GHz IEEE802.15.4 IP Portfolio – Technical Details

2.4GHz IEEE802.15.4 Radio

The radio operates in the 2.4-2.5GHz ISM frequency band. It has a single resistive, differential RF port, requiring no external matching components to interface to an antenna. It features an integrated TX/RX switch, VCO, channel filters and on-chip auto calibration, requiring no external adjustments and has integrated signal path ADCs & DACs. The radio is implemented in an industry standard 0.18um RF CMOS process and has been designed to readily enable process portability across different target technologies. The radio is designed to minimize power consumption and features a current consumption of <35mA, in receive and <30mA in transmit. It has class leading sensitivity of –93dBm and transmit power of +1dBm.

IEEE802.15.4 Modem

The IEEE802.15.4 modem provides O-QPSK spread spectrum modulation and demodulation of the baseband signals to and from the radio system. It converts 4 bit baseband symbols (at a 250kbps bitrate) to one of 16 quasi orthogonal 32 bit codes, giving an on air chip rate of 2Mchips/s. The receiver performs AGC gain setting, matched filtering, carrier frequency offset correction and chip timing recovery before using correlation techniques to extract the baseband data. The transmitter assembles the 32 bit codes from the incoming symbols using a look-up table and then applies half sine filtering.
IEEE802.15.4 Baseband Controller

The baseband controller provides hardware acceleration of many of the lower layer MAC functions, including super-frame and protocol timers, auto-acknowledgement with retries and CSMA/CA access. It is specifically designed for low processor overhead allowing operation with low-end processors and minimizes the system power consumption. Multiple power down modes are provided and a very low-power real-time-clock minimizes power consumption during sleep modes. The baseband controller also supports secure network communications through the inclusion of a hardware AES encryption block, implementing the CTR, CBC-MAC and CCM AES modes in-band on 802.15.4 packets. The AES block is also available for use by applications where required.

IEEE802.15.4 Protocol Stack

The protocol stack is an efficient implementation of the 802.15.4 MAC layer, with an interface at the service access point (SAP) defined by the standard. It links to higher layers such as ZigBee or proprietary systems using a simplified C-callable API, implementing functions such as “send packet,” “packet received,” “scan,” “associate,” “dissociate”, “set encryption”. Various configurations of the stack allow for minimal operation or IEEE802.15.4 reduced function and full-function devices all with various optimal code and data memory sizes. Example code is provided for a range of proprietary applications.

IEEE802.15.4 / ZigBee System-on-Chip IP

Jennic’s IEEE802.15.4 System on Chip is a single-chip design which integrates the baseband controller, modem and radio transceiver together with an onboard processor, memory and analogue and digital IO subsystems. The processor runs the protocol stack and has ample power to implement network/application layers. This design provides customers with a true single chip solution for applications requiring the 802.15.4 protocol, including ZigBee, in a compact, power-efficient package. It is suitable for implementation in an 8x8mm 56 lead QFN package.
About Jennic (www.jennic.com)

Jennic is a leading provider of Intellectual Property and silicon design services to the broadband communications market. Jennic combines its system expertise, advanced Intellectual Property portfolio and skills in digital, software, mixed-signal and SoC design to deliver performance, cost and time-to-market advantages to its system OEMs and semiconductor customers. Jennic’s Intellectual Property portfolio includes physical layer framers and bus bridges for wide and metro area networks, access network co-processors, line-card connectivity solutions and cellular, low power wireless and data mixed-signal systems. Founded in 1996 Jennic has its headquarters in Sheffield, England.

About IEEE802.15.4 (www.ieee802.org/15/pub/TG4.html)

The IEEE 802.15.4 Wireless Personal Area Network standard, approved in May 2003, provides a worldwide standard for low data rate solutions with multi-month to multi-year battery life and very low complexity. It is intended to operate in an unlicensed, international frequency band. Potential applications are residential and industrial control, personal health care, computer/gaming peripherals and consumer electronics.

About ZigBee (www.ZigBee.org)

The ZigBee Alliance is an association of companies working together to enable reliable, cost-effective, low-power, wirelessly networked monitoring and control products based on an open global standard. It works closely with the IEEE to ensure an integrated and complete solution for the market by taking advantage of the IEEE802.15.4 standard for the PHY and MAC layers and adding logical network, security and application software.

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