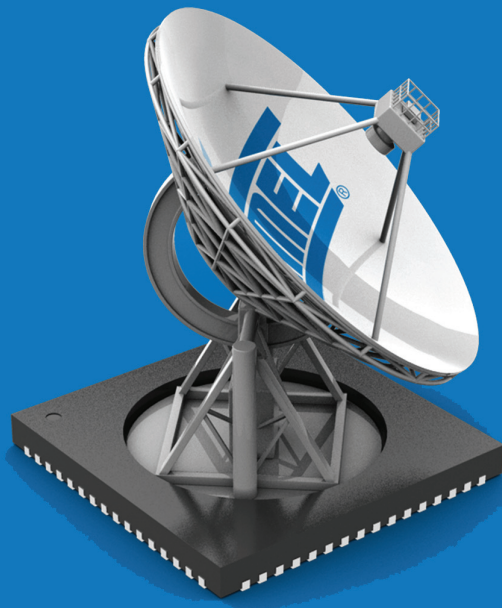Wireless just became easier

MCU Wireless Solutions

IEEE 802.15.4, ZigBee and IPv6/6LoWPAN Applications

- High System Performance
- Low Power Consumption
- High Level of Integration

www.atmel.com/wireless

ATMEL

RF Single-chip Solution

The IEEE 802.15.4-compliant Atmel single-chip combines the industry's leading AVR® microcontroller and a best-in-class 2.4GHz RF transceiver to deliver the industry's best single-chip design.

The ATmega128RFA1 is the leading device in this new single-chip family. The combination of low current consumption in all operating modes, a degradation-free supply voltage range down to 1.8V and fastest wake-up time from SLEEP mode to active modes make the ATmega128RFA1 to the most power efficient device in the market. Various power-down modes including the wake-on-radio feature enable further power optimizations, like keeping the RF transceiver active while the microcontroller sleeps. For more details on Atmel's RF Single-chip solution, visit www.atmel.com/wireless/singlechip.

Boost your overall system performance

The radio interface offers a unique hardware feature set to boost the overall system performance and to support a great variety of IEEE 802.15.4-compliant applications. The radio link reliability is additionally improved when using the antenna diversity feature which automatically selects the best from two antennas for each incoming frame. The device supports the control of external power amplifiers for range extension. High data rate modes up to 2 Mbit/s are available addressing general purpose 2.4GHz ISM applications.

The low-power single-chip design enables designers to implement new generation of battery driven systems, save board space and to bring down the overall system Bill of Material (BoM). System development is supported by Atmel's free software stacks, libraries and hardware evaluation and development kits.

Supported by the QTouch® Library, ATmega128RFA1 makes it easy to combine capacitive touch functionality with RF in a single chip. For more details on QTouch Library, visit www.atmel.com/QTouchLib.

Transceivers

Efficient wireless applications require high-performance and low-power components. Atmel transceivers deliver the leading RF link budget with the industry lowest power consumption.

Atmel offers the most feature rich IEEE 802.15.4-compliant transceiver family for the regional 700/800/900 MHz and the worldwide 2.4GHz frequency bands addressing wireless applications.

Using hardware features like antenna diversity or external power amplifier support, you can boost the outstanding transceiver performance even further to increase network reliability and RF range of your system. Beside IEEE 802.15.4-compliant applications, the transceiver family offers on-air data rates up to 2 Mbit/s for general purpose ISM applications. Pin compatibility ensures an easy transition between devices or frequency bands.

Free software suites, various hardware evaluation and development kits and modules enable your rapid system development and prototyping.

700/800/900 MHz Transceiver

The AT86RF212 is a low-power, low-voltage RF transceiver for the regional 700/800/900 MHz frequency bands available in China, Europe and North America. This transceiver offers an extreme 120 dB link budget (-110 dBm receiver sensitivity / +10 dBm transmit power) designed for low-cost IEEE 802.15.4, ZigBee®, and high data rate ISM applications.
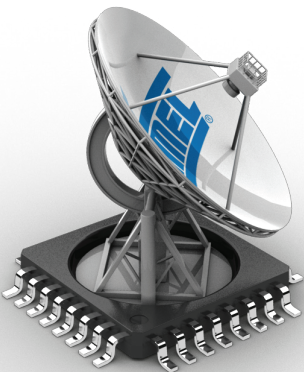
2.4GHz Transceivers

The AT86RF230 is a low-power 2.4 GHz transceiver specially designed for low cost IEEE 802.15.4, ZigBee and 6LoWPAN applications. The AT86RF230 is a true SPI-to-antenna solution. All RF-critical components except the antenna, crystal and de-coupling capacitors are integrated on-chip.

The AT86RF231 is a feature rich, low-power 2.4 GHz transceiver designed for industrial and consumer IEEE 802.15.4, ZigBee, 6LoWPAN and high data rate 2.4 GHz ISM band applications. The transceiver is a true SPI-to-antenna solution, including features like antenna diversity and onboard AES encryption. All RF-critical components except the antenna, crystal and de-coupling capacitors are integrated on-chip.

IEEE 802.15.4 Compliant Software

Atmel offers a suite of free and certified IEEE 802.15.4-compliant software stacks, like IEEE 802.15.4 MAC, IPv6/6LoWPAN, ZigBee RF4CE, ZigBee PRO, and ZigBee Smart Energy stacks. As result, choosing Atmel gives you a head start with ready to use wireless solutions and the shortest time to market.

IEEE 802.15.4 MAC | IPv6/6LoWPAN | RF4Control ZigBee RF4CE | BitCloud ZigBee PRO | BitCloud Profile Suite

Functionality
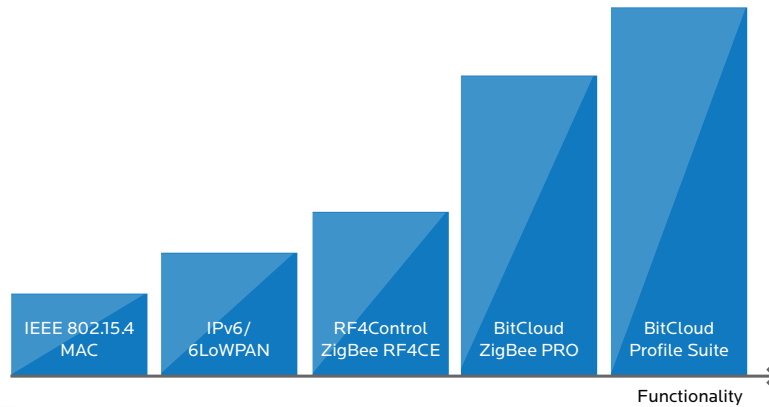
IEEE 802.15.4 MAC

The IEEE 802.15.4 standard defines the protocol and compatible interconnection for data communication devices using low data rate, low power and low complexity, short-range radio frequency (RF) transmissions in a wireless personal area network (WPAN). Atmel developed the MAC stack software for different target platforms (microcontroller and board) and RF transceivers based on a new architecture. This allows easy portability across various Atmel platforms and transceivers, and configurability to improve resource usage.

IPv6/6LoWPAN

The Atmel Route Under MAC (RUM) with support for IPv6 and 6LoWPAN is a highly flexible stack solution for low-power and low-cost wireless sensor network applications. For more details, visit www.atmel.com/6LoWPAN.

RF4Control - ZigBee RF4CE

RF4Control is Atmel's ZigBee RF4CE compliant embedded platform for Atmel's RF Single-chip Solution — ATmega128RFA1 — provides a global standard for advanced and easy-to-use RF remotes that delivers non-line-of-sight operation, two-way communication, longer range of use and extended battery life. For more details, visit www.atmel.com/RF4CE.

BitCloud - ZigBee PRO

BitCloud is Atmel's full-featured, 2nd generation embedded ZigBee PRO compliant platform for Atmel's megaAVR® and ARM® microcontrollers. The stack provides a software development platform for reliable, scalable, and secure wireless applications running on Atmel wireless platforms. For more details, visit www.atmel.com/BitCloud.

BitCloud Profile Suite

BitCloud Profile Suite is Atmel's ready-to-use framework for rapid development of ZigBee certified products, based on the IEEE 802.15.4 compliant BitCloud ZigBee PRO stack. The suite includes a complete set of fully functional reference implementations of ZigBee Smart Energy (ZSE), ZigBee Building Automation (ZBA) and ZigBee Home Automation (ZHA) device types. For more details, visit www.atmel.com/BitCloud-Profile-Suite.

ZigBee – Control You World

ZigBee is the global wireless language connecting dramatically different devices to work together and enhance everyday life. The ZigBee Alliance is a non-profit association of more than 300 member companies driving development of ZigBee wireless technology. The Alliance promotes worldwide adoption of ZigBee as the leading wirelessly networked, sensing and control standard for use in consumer electronic, energy, home, commercial and industrial areas. For more details on the ZigBee Alliance, visit www.ZigBee.org.

ZigBee® Member

Energy | Building | Home | Telecom | Health | Retail | Control
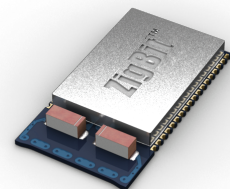
Devices

Product	Status	Flash (KBytes)	EEPROM (KBytes)	SRAM (KBytes)	ISM Band	Sensitivity (dBm)	Output Power (dBm)	Vcc (V) Range	Clock Speed (MHz)	Package	Pb-free, Green	Temp. Range(°C)
ATmega128RFA1	I	128	4	16	2,4 GHz	-100	-17 to +3.5	1.8-3.6	16	QFN64	Y	-40 to +85
AT86RF212	I	–	–	–	700/800/900 MHz	-110	-10 to +10	1.8-3.6	–	QFN32	Y	-40 to +85
AT86RF230	P	–	–	–	2,4 GHz	-101	-17 to +3	1.8-3.6	–	QFN32	Y	-40 to +85
AT86RF231	P	–	–	–	2,4 GHz	-101	-17 to +3	1.8-3.6	–	QFN32	Y	-40 to +85 -40 to +125

ZigBit Wireless Modules

ZigBits are compact 802.15.4/ZigBee modules featuring record-breaking range performance and exceptional ease of integration. ZigBits also pack a complete FCC/CE/ARIB certified RF design that eliminates costly and time-consuming RF development and gets your product to market on-time and on-budget.
Combine that with bundled IEEE 802.15.4 and ZigBee PRO-certified software, and it's no wonder that ZigBits are used world wide by system integrators and OEMs to add standards-based wireless connectivity to their products for energy efficiency, building automation, automated meter reading and more. For more details on the ZigBit Modules, visit www.atmel.com/ZigBit.

Development Tools

Product	Description	
ATmega128RFA1-EK1 Evaluation Kit	The ATmega128RFA1-EK1 Evaluation Kit enables development, debugging and demonstration of IEEE 802.15.4 compliant wireless applications such as ZigBee and 6LoWPAN. The kit contains two evaluation boards for ATmega128RFA1 covering the 2.4GHz ISM bands for use with STK600. For more details, visit www.atmel.com/ATmega128RFA1-EK1.	
RZ600 Evaluation Kit	The RZ600 evaluation kit enables development, debugging and demonstration of IEEE 802.15.4 compliant wireless applications such as ZigBee and 6LoWPAN. The kit contains evaluation boards for AT86RF212 and the AT86RF23x families of RF transceivers covering the regional 700/800/900MHz and worldwide 2.4GHz ISM bands for use with STK600. For more details, visit www.atmel.com/RZ600.	
RZRAVEN Evaluation Kit	The RZRAVEN 2.4 GHz Evaluation and Starter Kit enables development, debugging and demonstration of a wide range of lowpower wireless applications including IEEE 802.15.4, 6LoWPAN and ZigBee networks. The kit contains two RAVEN boards and one USB dongle. For more details, visit www.atmel.com/RZRAVEN.	
AVR Studio Design Software	AVR Studio is a full featured front-end Integrated Development Environment (IDE) for code development and debugging of AVR applications. For more details, visit www.atmel.com/AVRStudio.	
STK600 Starter Kit	Complete programming and development system supporting all 8-bit AVR and 32-bit AVR microcontrollers via socket adaptors.	
JTAGICE mkII Debugger	JTAGICE mkII is a powerful development tool for On-chip debugging of all 8-bit and 32-bit AVR microcontrollers.	

http://www.atmel.com/wireless
Device selection guide, Datasheets, Application Notes, Tools and Software

http://support.atmel.no
Official Atmel MCU technical support center including FAQ and email notification service