

## Atmel AT86RF215 IEEE 802.15.4g Transceiver



The Atmel<sup>®</sup> AT86RF215 transceiver is a dual-band sub-1 GHz/2.4 GHz device compliant to IEEE 802.15.4g-2012 and ETSI TS 102 887-1. It targets Smart Energy and automation applications and addresses the metering industry's need for low-cost multi-protocol connectivity solutions.

The AT86RF215 offers very high flexibility by supporting a variety of data rates with three modulation schemes: multi-rate and multi-regional frequency shift keying (MR-FSK), orthogonal frequency division multiplexing (MR-OFDM), and offset quadrature phase-shift keying (MR-O-QPSK). This includes the physical layer used for ZigBee<sup>®</sup> Pro and IP. Simultaneous operation at sub-1 GHz and 2.4 GHz enables new capabilities and the right cost structure in smart metering, smart lighting, home energy gateways and other industrial and automation equipment.

#### Key Features

- Fully integrated radio transceiver covering 389.5-510 MHz, 779-1020 MHz, and 2400-2483.5 MHz, including
  - European bands at 863-870 MHz, 870-876 MHz, and 915-921 MHz
  - Chinese bands at 470-510 MHz and 779-787 MHz
  - North American band at 902-928 MHz
  - Korean band at 917-923.5 MHz
  - Japanese band at 920-928 MHz
  - Worldwide ISM band at 2400-2483.5 MHz
- Supported PHYs (IEEE 802.15.4g-2012, IEEE 802.15.4-2011, and proprietary modes)
  - MR-FSK: 50...400 kbit/s with optional forward error correction and interleaving
  - MR-OFDM: 50...2400 kbit/s
  - MR-O-QPSK: 6.25...1000 kbit/s, 100...2000 kchip/s
  - O-QPSK: 250...1000 kbit/s, 1000 and 2000 kchip/s
- Simultaneous operation at sub-1 GHz and 2.4 GHz
- Bi-directional differential RF signal ports, one for sub-1 GHz
  and one for 2.4 GHz

- SPI interface to access registers and frame buffers
- LVDS interface to access 13-bit I/Q data
- · IEEE 802.15.4 MAC support
  - Frame filter
  - FCS handling
  - Automatic acknowledgement
  - CCA with automatic transmit
- Industry-leading link budget
  - Programmable TX output power up to +14 dBm
  - Receiver sensitivity down to -123 dBm
- Low power supply voltage from 1.8V to 3.6V
- Low current consumption
  - 30 nA in SLEEP mode
  - 28 mA in RX mode
  - 65 mA in TX mode @ 14 dBm output power
- Industrial temperature range from -40°C to +85°C
- 48-pin low-profile lead-free plastic QFN package

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### AT86RF215 IEEE 802.15.4g Transceiver



AT86RF215 Block Diagram

#### **Device Family Overview**

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| Device      | Description   |
|-------------|---|
| AT86RF215   | Sub-1 GHz/2.4 GHz transceiver compliant to IEEE 802.15.4g-2012, IEEE 802.15.4-2011, and ETSI TS 102 887-1 |
| AT86RF215M  | Sub-1 GHz transceiver compliant to IEEE 802.15.4g-2012, IEEE 802.15.4-2011, and ETSI TS 102 887-1         |
| AT86RF215IQ | Sub-1 GHz/2.4 GHz I/Q radio   |

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