

# EMB-ZRF231PA

## IEEE 802.15.4/ZigBee® - 2.4 GHz

### OEM Module



**EMB-ZRF231PA** is a 2.4 GHz OEM wireless module targeting low-power RF applications. The module is a simple and cost effective solution that provides IEEE 802.15.4 / ZigBee® wireless connectivity and multi-hop networking.

**EMB-ZRF231PA** can be configured as an embedded micro system or simple data modem for low power applications in the 2.4 GHz ISM band. It is based on the Atmel® AT86RF231, coupled with an ATxmega256A3U MCU equipped with 256 KByte of Flash memory, 16 KByte of RAM memory, up to 4 KByte of EEPROM, hardware acceleration for both IEEE 802.15.4 MAC and AES security and a 2.4 GHz radio frequency transceiver with an RF power amplifier.

The ad-hoc RF section, implemented by a PA/LNA stage, guarantees best-in-class performance in terms of covered area and power consumption. The output power can be increased up to +20 dBm by simple software configurations; input signals are amplified by the LNA section (sensitivity is up to -105 dBm). These features allow to establish links covering distances up to 1 km (LoS); finally, the U.FL receptacle allows to connect an external antenna.

**EMB-ZRF231PA** can communicate with other devices through a wide range of serial interfaces: two UART ports, I2C and SPI, several digital and analog I/O ports (up to 42 digital lines and 8 ADC) useful for the management of external devices and interfaces. Targets of the module are flexibility and power-awareness: **EMB-ZRF231PA** can be configured as network coordinator or router, as well as an end-device thanks to the extremely reduced power consumption (less than 1.1 µA in sleep mode).

**EMB-ZRF231PA** firmware can be easily developed since the module is compatible with Atmel® BitCloud® ZigBee stack and Atmel® Lightweight Mesh stack. Atmel® software and development tools are provided together with documentation and tools developed by Embit to quickly get started.

#### TECHNICAL SPECIFICATIONS

MCU	Atmel® AVR® ATxmega256A3U
Memory	16 KB RAM / 256 KB Flash 4 KB EEPROM
Frequency	2405 ÷ 2480 MHz
Tx output power	up to +20 dBm
Rx sensitivity	up to -105 dBm
Data rate	250 Kbps (802.15.4) 2 Mbps (proprietary)
Interfaces	UART/I2C/SPI/PDI
Digital I/O	up to 42 lines
Analog I/O	up to 8 12-bit channels
Outdoor link range	Over 1000m (LoS)
Indoor link range	High wall penetration capability for indoor use
Supply voltage	2.0 – 3.6 V
Tx current	132 mA @ +20 dBm
Rx current	24 mA
Sleep Current	≤ 1.1 µA
Timer	4 ch., 16 bit, PWM
Antenna	PCB printed inverted F antenna U.FL connector
Dimensions	29.5x22.6x3.5 mm Standard Embit form factor
Connector	SMD Edge Connector
Temperature Range	-40 to +85 °C
Certifications	CE



Via Emilia Est, 911  
41122 - Modena (Italy)  
tel. +39 059 371714  
fax: +39 059 3680498  
[www.embit.eu](http://www.embit.eu) - [info@embit.eu](mailto:info@embit.eu)

**Atmel**

Atmel®, the Atmel logo and combinations thereof, and others are the registered trademarks or trademarks of Atmel Corporation of its subsidiaries.