MeshNetics®

Wireless Modules Networking Things

2006 FROST & SULLIVAN Excellence in Technology Award

ZigBit™ OEM Modules

Ultra-Compact 2.4GHz IEEE802.15.4/ZigBee™ Modules for Wireless Mesh Networking Applications

ZigBit is a low-power, high-sensitivity 802.15.4/ZigBee OEM module. ZigBit packs impressive functionality into less than a square inch of space. Based on a solid combination of the popular ATmega 1281v MCU and the latest Atmel AT86RF230 radio transceiver, the ZigBit offers superior radio performance with exceptional ease of integration. The ZigBit module eliminates the need for costly and time-consuming RF development, and shortens time to market for a wide range of wireless applications. 802.15.4/ZigBee embedded software ensures standards based wireless connectivity of your products.

Benefits

- Faster time-to-market
- Less physical space constraints
- Extended RF link range
- Longer battery life
- Easy prototyping with 2-layer PCB
- More memory for user software application
- Robust mesh networking capability
- Easy-to-use development tools
- Single source of support for HW and SW
- Worldwide license-free operation

Key Features

- Ultra compact size: 18.8mm x 13.5mm, 0.53” x 0.74” (RF output version)
- 2 Antenna options (dual chip antenna and RF output versions)
- High sensitivity (104 dB Link Budget)
- Very low power consumption (6 uA in sleep mode)
- Wide range of interfaces, incl. UART, I^2C and 1-wire
- Reference hardware drivers
- Optional antenna reference designs
- High immunity to radio interference
- Comprehensive set of AT commands
- 802.15.4/ZigBee stack
- Self-organizing, self-healing mesh network
- Network-wide power management software
- Sample applications library

Actual Size

Dual Chip Antenna Version

Balanced RF Output Version

Where ZigBit™ Fits


Building automation & monitoring

Automated meter reading (AMR)


HVAC monitoring & control


Industrial monitoring


Predictive maintenance


Asset tracking

Industry-leading Atmel® Hardware

The ZigBit is based on the innovative Atmel 802.15.4 hardware platform. The powerful ATmega 1281v MCU features an impressive 128kb of flash memory. The AT86RF230 transceiver boasts -101dBm of Rx sensitivity and up to +3dBm of Tx power. This combination, called the "link budget," is related to its range of operation. The difference in link budget – just 9 dBm – nearly triples its range. Thanks to the outperforming link budget, the range of AT86RF230 is 2.8 times that of its competitors.

Software Options: eZeeNet™, SerialNet and OpenMAC

The ZigBit module features robust 802.15.4/ZigBee stack that supports a self-healing, self-organizing mesh network, while optimizing network traffic and minimizing power consumption. MeshNetics offers three stack configurations: eZeeNet, SerialNet and OpenMAC. eZeeNet is a robust 802.15.4/ZigBee software stack that is tailored for easy-to-use networking in sensing, control, monitoring and data acquisition applications. It supports mesh and tree network topologies. SerialNet allows programming of the module via serial AT-command interface. Developers can control eZeeNet software stack without any need to program the MCU directly. OpenMAC is MeshNetics’ open source implementation of IEEE802.15.4 MAC layer intended for embedded software experts and enthusiasts.

Easy Development with ZigBit™ Evaluation and Development Kits

Evaluation Kit is a convenient way to assess range performance and power consumption of modules in the field. On top of this functionality, the Development Kit also enables developers to write custom embedded applications using eZeeNet API. Each kit includes evaluation boards with sensors, accessories, software and documentation.

ZigBee™Alliance FC CE

Industry Canada Industrie Canada RoHS

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Competent Support

Over the years, MeshNetics has accumulated a unique range of experience in hardware, firmware and software design and development. This one-of-a-kind combination of experience-based knowledge enables Meshnetics to provide efficient support for both hardware and software-related questions. We also extend our support by offering professional customization services to make our products best fit clients' special application needs. As an IP owner, MeshNetics offers superior technical support on all its software products.

Interfaces

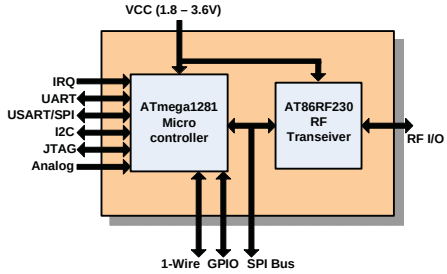
USART/SPI, UART with CTS/RTS control, I^2C, 1-wire, JTAG, 9 spare GPIOs (up to 25 GPIOs total), 2 spare IRQ lines, 4 ADC lines, and RF I/O.

Preliminary Specifications

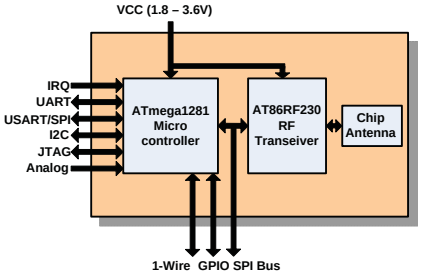
Parameter	ZigBit	Unit
Frequency band	2.400 – 2.483	GHz
Number of channels	16	
Data rate	250	kbit/s
Max output power	3	dBm
2nd harmonic	-28	dBm
3rd harmonic	-26	dBm
Sensitivity (PER 1%)	-101	dBm
Adjacent Channel Rejection	27	dB
Alternate Channel Rejection	53	dB
Supply voltage	1.8 – 3.6	Volt
Current consumption, RX	19	mA
Current consumption, TX	18	mA
Current consumption (Sleep mode)	6	µA
Flash memory	128	kB
RAM	8	kB
EEPROM	4	kB
Operating Temperature	-40/+85	°C

Block Diagrams

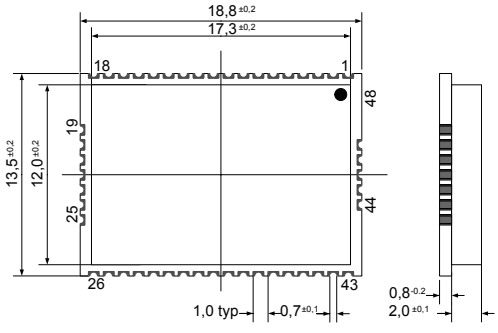
ZigBit with Balanced RF Output
(for Use with PCB Antenna)
Part Number: ZDM-A1281-B0



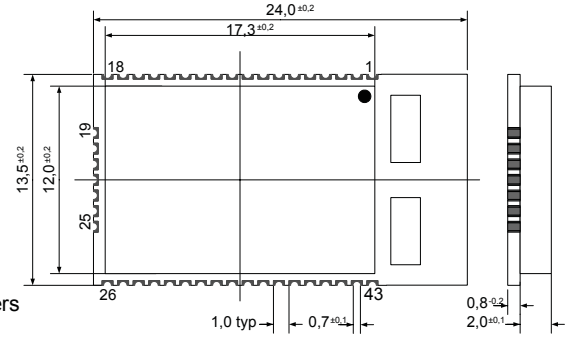
ZigBit with Dual Chip Antenna
Part Number: ZDM-A1281-A2



Mechanical Drawings



All dimensions are in millimeters



Ordering Information

Part Number: ZDM-A1281-B0
Description: 2.4GHz IEEE802.15.4/ZigBee™ OEM Module w/Balanced RF Port

Part Number: ZDM-A1281-A2
Description: 2.4GHz IEEE802.15.4/ZigBee™ OEM Module w/Dual Chip Antenna

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