

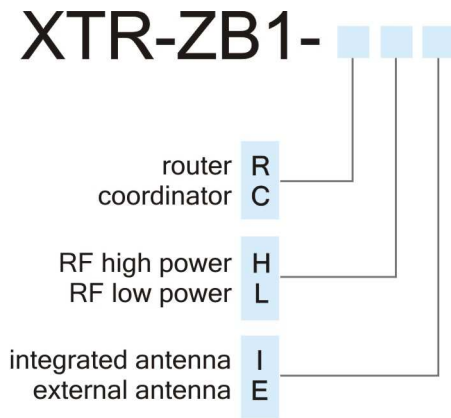


**High Power
2.4 GHz 802.15.4 ZigBee Modules
for Wireless Networking Applications**

XTR-ZB1-xHE



Le caratteristiche tecniche possono subire variazioni senza preavviso. AUREL S.p.A. non si assume la responsabilità di danni causati dall'uso improprio del dispositivo.



XTR-ZB1-xHE AUREL Modules, has features standards-based IEEE 802.15.4, and ZigBee networking protocols. It works on ISM 2.4GHz and it is suits for low-power, long-range applications, thanks to chances to use networks nodes as signal repeaters.

It use a DSSS (Direct Sequence Spread Spectrum) technique that gives the opportunity to operate in even the most hard-to-access places, and strongly reduces the interferences due to the narrowband signals.

Module can be connected to an external microcontroller through a serial interface that permit to sends commands for network management, and for the data packets transmission (see the “Commands User Manual for AUREL module XTR-ZB1”).

Module Transceiver is equipped with a SMA connector that permit an external antenna connection. RF power to the connector is equal to 13 dBm and the ERP TX power is given by the gain of the used antenna.

Module conformation besides, place at Users' disposal a series of I/O digitals and analogue inputs permitting to rise the network performance.

KEY FEATURES

- MESH configuration
- Network programmable parameters
- Data Rate 250 Kbps RF
- **High Sensitivity (-103dBm)**
- 16 available channels
- AES encryption to128 bits auto and transparent to the Users
- Tiny size (30x26mm)
- Authomatic channels change in all the network
- Easy-and-quick nodes enlargement to improve your network

Absolute limits

Operating temperature range	-40 °C ÷ +85 °C
Power supply	-0.3 ÷ +3.6V
Input Voltage	-0.3 ÷ V _{cc} +0.3V
Output Voltage	-0.3 ÷ V _{cc} +0.3V

Technical Specifications

Parameter	Min.	Tip.	Max.	Value
DC Levels				
Power Supply	2.0	3.3	3.6	V
Current Consumption (RX mode)		43		mA
Current Consumption (TX mode)	78	92	100	mA
RF Characteristics				
Frequency Band	2405 – 2483			MHz
Modulation Type		O-QPSK		
RX Sensitivity		-103		dBm
TX Output Power		13		dBm
Performance				
RF Data Rate	250			Kbps
Serial Data Rate	38400			bps
Number of channels		16		
Bandwith		3		MHz
Channel Spacing		5		MHz
Operating temperature range	-40		+85	°C
Module Size	30 x 26			mm

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PIN Configuration

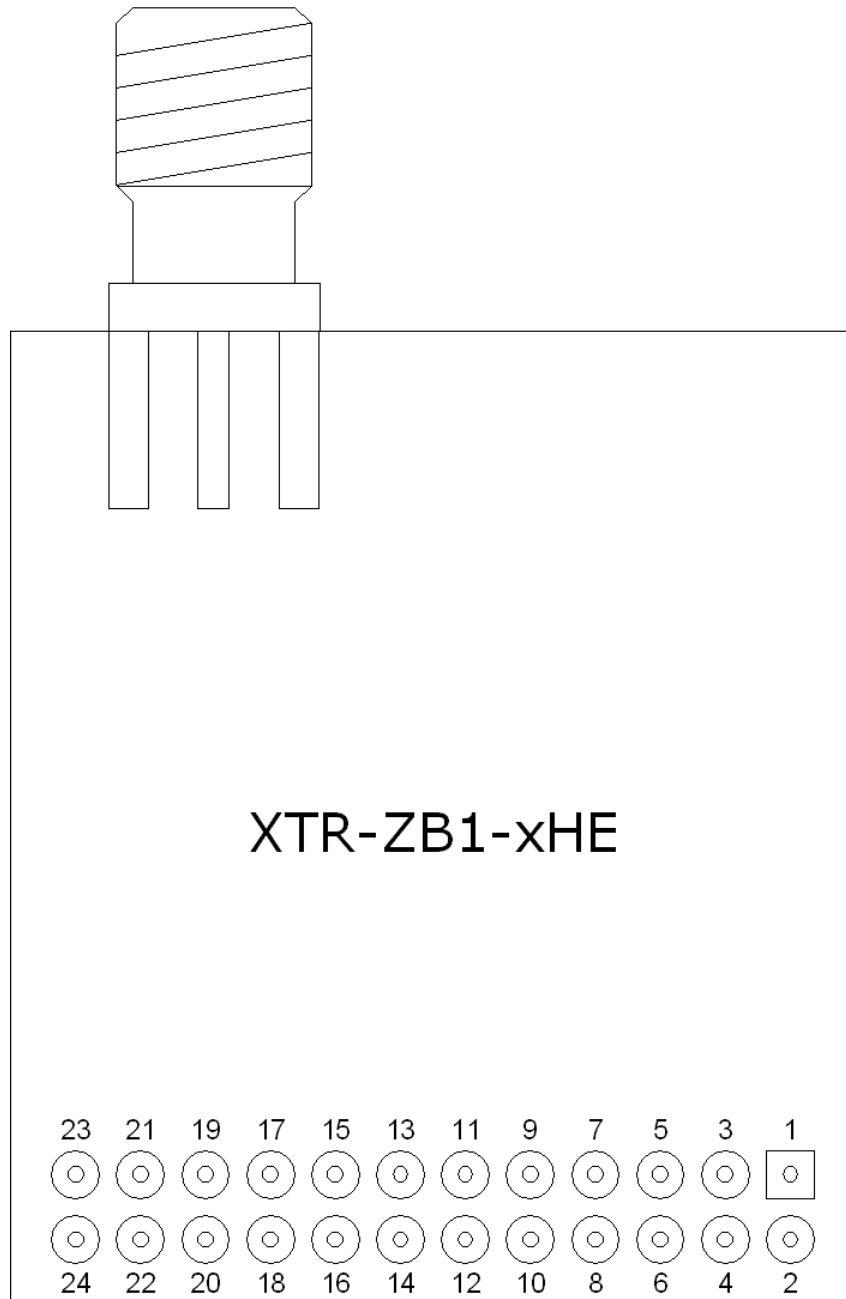


Fig. 1: Device pinout

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Pin		Description
1	Vcc	Module power supply (2.0-3.6V) rightly filtrate and regulated.
2	GND	Connected to GND
3	Input R.	Module Hardware Reset (when it's low). This line is normally up (input pull up) and when it forced down, will run a reset simulating a complete loss of power supply (see Commands User Manual for AUREL module XTR-ZB1).
4	ADC1	Radio Module ADC input (14 bits max. resolution).
5	RSTX	Serial data output..
6	RSRX	Serial data input
7	RTS	Request-to-send Output. This line has brought up from module when receiver buffer is full. In this case should be necessary stop serial data transmission toward module, because some data can be missed. When this line is low, module can accept serial data transmission.
8	CTS	Clear-to-send input. Module, in case some data are ready to be send through serial line, doesn't not ship them if the line is forced high from the outside, but only otherwise.
9	ADC3	ADC Input (14 bits max. resolution).
10	GND	Connected to GND
11	ADC2	ADC input (14 bits max. resolution).
12	ADC4	ADC input (14 bits max. resolution).
13	OUT 1	Digital Module output (20mA).
14	OUT R.	Reserved Digital output that indicates If the Module is ON (see "Usage Guide Demo Board XTR-ZB1 Router").
15	OUT 3	Digital Module output (4mA).
16	OUT 2	Digital Module output (4mA).
17	IN 1	Digital Module input (pull up)
18	OUT 4	Digital Module output (4mA).
19	IN 3	Digital Module input (pull up).
20	IN2	Digital Module input (pull up).
21	INTERRUPT	Radio Module Interrupt. This line is normally up (input pull up) and when it forced down will run an interrupt. Then Radio Module sends a message to the network coordinator seguito del quale il modulo radio invia un messaggio al coordinatore della rete (see "Commands User Manual for AUREL module XTR-ZB1").
22	PWD	Close Down Power Saving mode PIN for End Device. Normally up when it forced down, ED going from Power Down to ON passa dallo Stato di Power Down allo stato attivo (vedi "Usage Guide Demo Board XTR-ZB1 Router").
23	GND	Connected to GND
24	RESET	HALF and FULL Reset (vedi "Commands User Manual for AUREL module XTR-ZB1") of Radio Module.. This line is normally up (input pull up) when it forced down will run a Reset.

Tab. 1: PIN description.

Device Working conditions

To obtain the performances specified above, and enforce the conditions expressly declared onto Certifications, Module must be mounted into a printed board taking into account as follow:

Power Supply

1. Module must be powered by a very low Voltage source, protected against the short circuits.
Power source variation admitted: $2.0 \div 3.6V$
2. Decoupling, near the transmitter, with ceramic capacitor of minimum capacity 100.000 pF.

Ground:

It should surrounding at best the weld area of transceiver. Ground plane must be realized into the lower surface and must not be present close to the integrated antenna, in order to coupling avoid.

Other components

1. In case of Module assembling parallel to the printed circuit, doesn't print tracks close to the integrated antenna.
2. Keep away the Module from the others circuit components (up to 5 mm)
3. away and shielded microprocessors and their clock circuits.

Certification requirements

XTR-ZB1-xHE Modules fully satisfies the European legislations EN 300-228 and EN 301-489 with max. power supply of 3.6V.

Products are tested following the directive **EN 60950** and it can be used inside a dedicated insulated containers, assuring the harmony with the above standards. Module must be powered by a very low Voltage source, protected against the short circuits.

If Modules are incorporated into a product the Users must ensure the antenna insulation, due output RF transmitter can't support directly the static charges foreseen by the **EN 61000-4-2** standards.

Modules can be installed inside containers that assuring the surpassing of **EN 61000** standards, are not directly applicable to it.

Module Layout

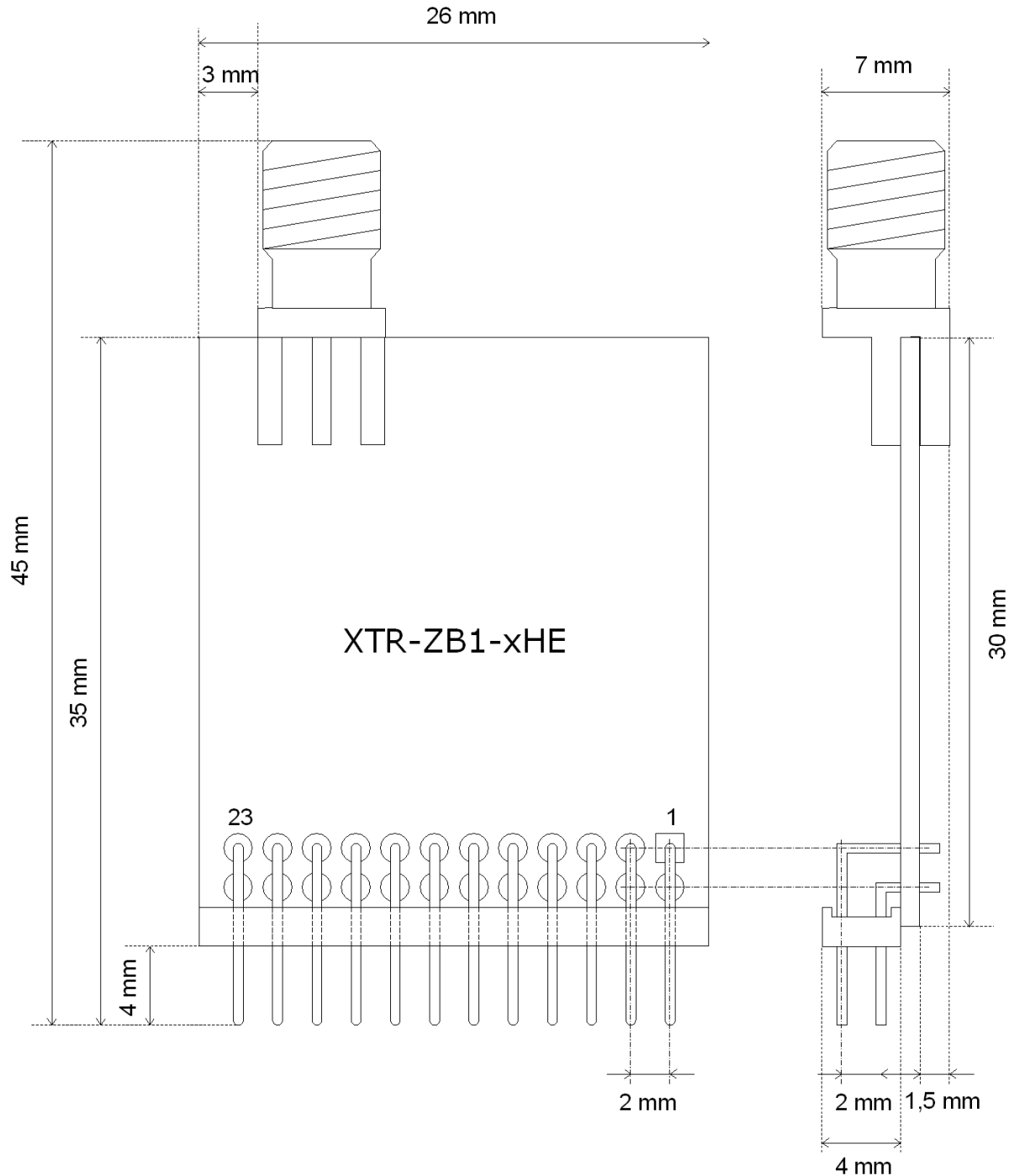


Fig. 2: Layout

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