Innr ZigBee Module, US variant
Innr ZB Mod v1.1 US
Datasheet

Edition	Completion Date	Revision record	Author	Examine	Approve
V1.0	2016-07-20	establish	kui		
V1.1	2018-06-10	change pin and **Silk screen font**	kui		

catalogue

1　summary

Innr ZB Mod v1.1 US is a ZigBee 3.0 reference design module based on embedded chip (JN5169). Stamp hole interface, PCB on-board antenna, small size, easy to develop, rich interface. The module is suitable for intelligent household appliances, smart home, intelligent toys, industrial control of things applications. This specification specifies the physical characteristics, technical specifications, communication protocols, product functions, performance, stability, environmental adaptability and security of the module.

2　characteristic

2.1　Interface

- Stamp hole interface, spacing 1.5mm
- Single chip device to run stack and application
- Very low RX current for low standby power of mains powered nodes
- Integrated power amplifier for long range and robust communication
- Highly featured 32-bit RISC CPU for high performance and low power
- Large embedded Flash memory to enable over-the-air firmware updates without external Flash memory
- Temperature range: 40 C to +125 C

2.2　wireless

- 2.4 GHz IEEE802.15.4 compliant
- ZigBee 3.0
- RX current 14.7 mA, in low power receive mode 13 mA
- Receiver sensitivity -96 dBm
- Configurable transmit power, for example:
  10 dBm, 23.3 mA
  8.5 dBm, 19.6 mA
  3 dBm, 14 mA
- Radio link budget 106 dB
- Maximum input level of +10 dBm
- Compensation for temperature drift of crystal oscillator frequency
- 128-bit AES security processor
- MAC accelerator with packet formatting, CRCs, address check, auto-acks, timers
- Integrated ultra low-power RC sleep oscillator (0.7 A)
- 2.0 V to 3.6 V battery operation
- Deep sleep current 50 nA (wake-up from IO)

2.3 else

- ➢ 2 UARTs: one capable of hardware flow control (4-wire, includes RTS/CTS); the other just 2-wire (RX/TX)
- ➢ Master SPI-bus port with 3 select outputs
- ➢ Slave SPI-bus port
- ➢ 1 programmable timer/counter which supports Pulse Width Modulation (PWM) and capture/compare, plus 4 PWM timers which support PWM and Timer modes only

3 Size of product

Table 3 / 1 list of product specifications

	Heading	Parameter number	remarks
Wireless part	Support for ZigBee 3.0	2.4 GHz IEEE802.15.4 compliant	
	Radio frequency system impedance	50 Ω	
	SWR	<-10dB	
	frequency range	2.4~2.4835 GHz	
	receiving sensitivity	20MHz MCS7@-71dBm； 40MHz MCS7@-68dBm； 54Mbps@-73dBm； 11Mbps@- 87dBm； 1Mbps@-95dBm；	
	modulation mode	DSSS、OFDM、DBPSK、DQPSK、CCK、QAM16/64	
	output power	IEEE802.15.4 , DSSS 1Mbps, POUT = +17dBm；	

	interface type	UART、SPI、GPIO、PWM、I²C、I²S	
Hardware part	interface rate	2Mbps@UART (Max) 50Mbps@SPI (Max)	
	working voltage	2.0V－3.6V	
	working current	10mA－25mA	
	working humidity	5%~90%（No condensation）	
	Storage temperature	-40~+125 ℃	
	working temperature	-40~+85℃	
	outline dimension	14.7mm×22.3mm	

The module pin arrangement and size information is shown in figure 4 / 1:
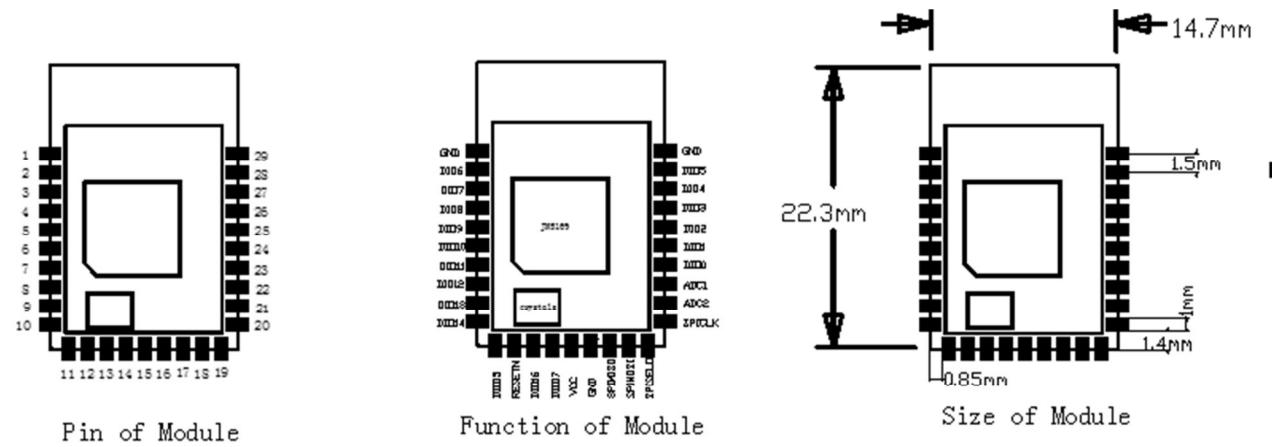

Pin of Module

Function of Module

Size of Module

Fig. 4 / 1 module pin arrangement and size diagram

The module pin instructions are shown in Table 4 / 1:

Table 4 /1 Module Pin Description.

Module Pin	type	Symbol	Description
1	GND	VSS	V SS — ground
2	I/O	DIO6	DIO6/TXD0/JTAG_TDO/PWM2
3	I/O	DIO7	DIO7/RXD0/JTAG_TDI/PWM3
4	I/O	DIO8	DIO8/TIM0CK_GT/PC1/PWM4
5	I/O	DIO9	DIO9/TIM0CAP/32KXTALIN/RXD1/32KIN
6	I/O	DIO10	DIO10/TIM0OUT/32KXTALOUT
7	I/O	DIO11	DIO11/PWM1/TXD1
8	I/O	DIO12	DIO12 — DIO12 PWM2 — PWM2 output CTS0 — UART0 clear to send input JTAG_TCK — JTAG CLK input ADO — antenna diversity odd output SPISMOSI — SPI-bus slave Master Out, Slave In input
9	I/O	DIO13	DIO13 — DIO13 PWM3 — PWM3 output RTS0 — UART0 request to send output JTAG_TMS — JTAG mode select input ADE — antenna diversity even output SPISMISO — SPI-bus slave master in slave out output
10	I/O	DIO14	DIO14 — DIO14 SIF_CLK — serial interface clock TXD0 — UART 0 transmit data output TXD1 — UART 1 transmit data output JTAG_TDO — JTAG data output SPISEL1 — SPI-bus master select output 1 SPISSEL — SPI-bus slave select input
11	I/O	DIO15	DIO15 — DIO15 SIF_D — serial interface data RXD0 — UART 0 receive data input RXD1 — UART 1 receive data input JTAG_TDI — JTAG data input SPISEL2 — SPI-bus master select output 2 SPISCLK — SPI-bus slave clock input
12	I	RESET_N	RESET_N — reset input
13	I/O	DIO16	DIO16/SPISMOSI/SIF_CLK/COMP1P
14	I/O	DIO17	DIO17/SPISMISO/SIF_D/COMP1M/PWM4
15	I/O	V DDA	V DDA — analog supply voltage

16	GND	V SS	V SS — ground
17	I/O	DO1	DO1 — DO1 SPIMISO — SPI-bus Master In, Slave Out input PWM3 — PWM3 output
18	I/O	DIO18/SPIMOSI	DIO18 — DIO18 SPIMOSI — SPI-bus Master Out Slave In output
19	I/O	DIO19/SPISEL0	DIO19 — DIO19 SPISEL0 — SPI-bus master Select Output 0
20	O	DO0/SPICLK/PWM2	DO0 — DO0 SPICLK — SPI-bus master clock output PWM2 — PWM2 output
21	P/I	VREF/ADC2	VREF — analog peripheral reference voltage ADC2 — ADC input 2
22	I	ADC1	ADC1 — ADC input
23	I	DIO0/ADO/SPISEL1/ADC3	DIO0 — DIO0 ADO — antenna diversity odd output SPISEL1 — SPI-bus master select output 1 ADC3 — ADC input: ADC3
24	I/O	DIO1/ADE/SPISEL2/ADC4/PC0	DIO1 — DIO1 ADE — antenna diversity even output SPISEL2 — SPI-bus master select output 2 ADC4 — ADC input: ADC4 PC0 — pulse counter 0 input
25	I/O	DIO2/RFRX/TIM0CK_GT/ADC5	DIO2 — DIO2 RFRX — radio receiver control output TIM0CK_GT — timer0 clock/gate input ADC5 — ADC input: ADC5
26	I/O	DIO3/RFTX/TIM0CAP/ADC6	DIO3 — DIO3 RFTX — radio transmitter control output TIM0CAP — timer0 capture input ADC6 — ADC input: ADC6
27	I/O	DIO4/CTS0/JTAG_TCK/TIM0OUT/PC0	DIO4 — DIO4 CTS0 — UART 0 clear to send input JTAG_TCK — JTAG CLK input TIM0OUT — timer0 PWM output PC0 — pulse counter 0 input
28	I/O	DIO5/RTS0/JTAG_TMS/PWM1/PC1	DIO5 — DIO5 RTS0 — UART 0 request to send output JTAG_TMS — JTAG mode select input PWM1 — PWM1 output PC1 — pulse counter 1 input
29	GND	V SS	V SS — ground

4,FCC ID warnings:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) his device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

Note: The Grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. such modifications could void the user's authority to operate the equipment.

The OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

IMPORTANT NOTE: In the event that these conditions cannot be met (for example co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The Innr ZB Mod v1.1 module is designed to comply with the FCC statement. FCC ID is 2AVYZINNRZBM11. The host system using Innr ZB Mod v1.1, should have label indicated it contain modular's FCC ID: 2AVYZINNRZBM11.

The device has been evaluated to meet general RF exposure requirement.
To maintain compliance with FCC's RF exposure guidelines, the distance must be at least 20 cm between the radiator and your body, and fully supported by the operating and installation configurations of transmitter and its antenna(s).

IC Warning:

If the IC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following:
"Contains Transmitter Module IC: 25992-INNRZBM11
When the module is installed inside another device, the user manual of this device must contain below warning statements:
This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
(1) l'appareil ne doit pas produire de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.