ZM5168P2-xC Series

Zigbee Module

V1.00　　　Date: 2014/03/10

Item	Contents
Terms	JN5168　ZM5168P2-X　Zigbee module
Abstract	This document mainly describes the hardware parameters and usage of the ZM5168 Zigbee module.

Revision History

Version	Rev. Date	Modifications
V1.00	2013-12-04	Original version
V1.00	2014-03-10	Translated to English

Contents

Chapter 1: Overview

ZM5168P2-xC series module developed by Guangzhou ZHIYUAN Electronics Stock Co., Ltd is a low power and high performance ZigBee module based on NXP JN5168. It provides a complete application-integration solution based on the ISM (2.4-2.5GHz) band of IEEE802.15.4 standard. ZM5168 series module supports JenNet-IP, ZigBee-PRO, RF4CE and other protocol. It can be quickly applied into the intelligent home system, intelligent remote control system, etc.

ZM5168 series ZigBee module integrates complete RF circuit to a compact size board and provides built-in communication protocol in its MCU. It can save user's development time on wireless communications, further reduce the time to market of user's products, make them more competitive to others.

Figure 1-1: Picture of ZM5168 series module

The ZM5168 series module provides appropriate communication protocols for different application field. The factory default protocol is JenNet-IP network communication protocol. The subsequent protocols are being developed.

Chapter 2: Hardware

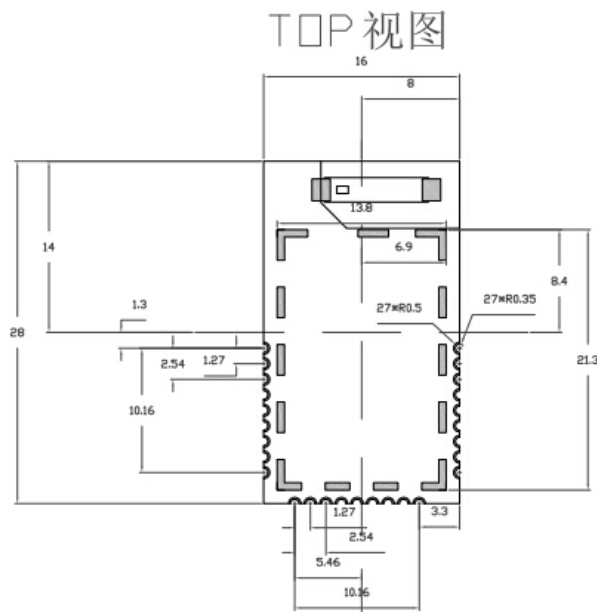## 2.1 Physical dimensions

Figure 2-1: Physical dimensions of ZM5168 series module

2.2 Pins of ZM5168P2-xC series module

Figure 2-2 shows the pin assignment of ZM5168 series module. Table 2-1 shows the descriptions of individual pin.
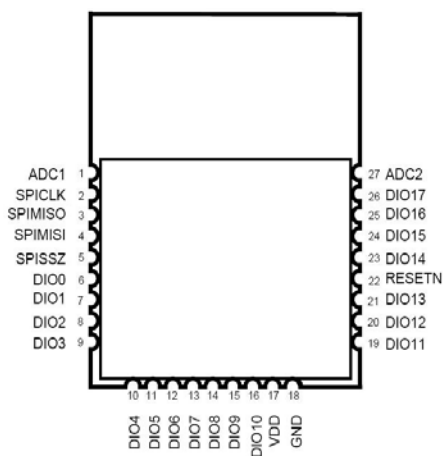

Figure 2-2: Pin assignments

Table 2-1: Pin descriptions

Pin #	Name	Function				Description
1	ADC1					ADC1 input
2	SPICLK				PWM2	SPI clock signal and PWM2 output
3	SPIMISO					SPI Master In/ Slave Out
4	SPIMOSI				PWM3	SPI Slave In/ Master Out and PWM3 output
5	SPISEL0					SPI Selection – SS0 output
6	DIO0	SPISEL1	ADC3			DIO0, SPI Selection output 1 and ADC3 input
7	DIO1	SPISEL2	ADC4	PC0		DIO1, SPI Selection 2, ADC4 input and pulse counter 0 input
8	DIO2		RFRX	TIM0CK_GT		DIO2, RF receiving control output and TIM0 clock/gate control input
9	DIO3		RFTX	TIM0CAP		DIO3, RF transmitting control output and TIM0 capture input
10	DIO4	CTS0	JTAG_TCK	TIM0OUT	PC0	DIO4, UART0 clear-to- send, JTAG clock and pulse counter 0 input
11	DIO5	RTS0	JTAG_TMS	PWM1	PC1	DIO5, UART0 request to send, JTAG mode selection, PWM1 output and pulse counter 1 input
12	DIO6	TXD0	JTAG_TDO	PWM2		DIO6, UART0 transmitting pin, JTAG data output and PWM2 output
13	DIO7	RXD0	JTAG_TDI	PWM3		DIO7, UART receiving pin, JTAG data input and PWM3 output
14	DEF	TIM0CK_GT	PC1	PWM4		Default serial port setting. There is an internal pull-up on this pin and the pin is set to LOW when module is power on. The setting of

Pin #	Name	Function				Description
						serial port is 115200 8N1. The pin is unconnected when not used.
15	DIO9	TIM0CAP	32KXTALIN	RXD1	32KIN	DIO9, TIM0 capture input, UART1 receiving pin and the input of 32K external clock
16	STATE	TIM0OUT	32KXTALOUT			State indication. It should be externally connected to an indicator. The indicator blinks when the module is running.
17	VDD					Power supply
18	GND					Grounding
19	DIO11	PWM1		TXD1		DIO11, PWM1 output and UART1 receiving pin
20	DIO12	PWM2	CTS0	JTAG_TCK	ADO SPISMISO	DIO12, PWM2 output, UART0 clear-to-send, JTAG clock input, antenna diversity odd output and SPI Master In/Slave output
21	DIO13	PWM3	RTS0	JTAG_TMS	ADE SPISMISO	DIO13, PWM3 output, UART0 request to send, JTAG mode selection input, antenna diversity even output and SPI Master In/Slave output
22	RESETN					Reset input
23	DIO14	SIF_CLK	TXD0/TXD1	JTAG_TDO	SPISEL1 SPISSEL	DIO14, serial interface clock, UART0/1 transmitting pin, JTAG data output, SPI Master selection output /slave selection input
24	DIO15	SIF_D	RXD0/RXD1	JTAG_TDI	SPISEL2	DIO15, serial interface data pin, UART0/1 receiving pin, JTAG data input and SPI master selection output 2
25	LINK	COMP1P	SIF_CLK	SPISMOSI		On-line indication. There is an internal pull-up on this pin and the pin is low when the

Pin #	Name	Function				Description
						module is connected to a network. The pin is unconnected when not used.
26	DIO17	COMP1M	PWM4	I2C DATA	SPISIMO	DIO17, Comparator negative input, PWM4 output, serial interface data and SPI Slave In/Master Out
27	ADC2					ADC2 input

2.3 Product Specifications

VDD=3.0V @ +25°C

Table 2-2: Product Specifications

Typical DC Characteristics			Notes
	ZM5168P2-1C	ZM5168P2-2C	
Current consumption in deep sleep mode	100nA	100nA	
Current consumption in sleep mode	0.7uA	0.7uA	The timer is in working state
Transmitting current	175mA	175mA	
Receiving current	22mA	22mA	
Center frequency drift	+/-25ppm	+/-25ppm	Do not include the additional +/-15ppm caused by temperature or aging
Typical RF Characteristics			Notes
Receiving sensitivity	-100 dBm	-100 dBm	
Transmitting power	22 dBm	22 dBm	
Maximum receiving power	5 dBm	5 dBm	
RSSI range	-105 dBm to -20 dBm	-105 dBm to -20 dBm	
Output impedance	50 Ω	50 Ω	

2.4 Electrical Characteristics

2.4.1 Rated Value

Parameters	Min	Max
Power Supply	-0.3V	3.6V
Pin voltage	-0.3V	VDD+0.3V
Temperature Range	-40℃	150℃

2.4.2 Operating Condition

Parameters	Min	Max
Voltage	2.1V	3.6V
Temperature	-40℃	85℃

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Important compliance information for North American users

The ZM5168 series Module has been granted modular approval for mobile applications. Integrators may use the ZM5168 series Module in their final products without additional FCC certification if they meet the following conditions. Otherwise, additional FCC approvals must be obtained.

1.   At least 20cm separation distance between the antenna and the user's body must be maintained at all times.

2.   To comply with FCC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile-only exposure condition must not exceed 5dBi in the 2.4G band.

3.   The ZM5168 series Module and its antenna must not be co-located or operating in conjunction with any other transmitter or antenna within a host device.

4.   A label must be affixed to the outside of the end product into which the ZM5168 series Module is incorporated, with a statement similar to the following: For ZM5168 series Module: This device contains FCC ID: ODH-ZM5168.

5.   A user manual with the end product must clearly indicate the operating requirements and conditions that must be observed to ensure compliance with current FCC RF exposure guidelines. The end product with an embedded ZM5168 series Module may also need to pass the FCC Part 15 unintentional emission testing requirements and be properly authorized per FCC Part 15.

Note: If this module is intended for use in a po rtable device, you are responsible for separate approval to satisfy the SAR requirements of FCC Part 2.1093.

FCC NOTICE:

This device complies with Part 15 of the FCC Ru les [and with RSS-210 of Industry Canada].

Operation is subject to the following two conditions:

(1)   this device may not cause harmful interference, and

(2)   this device must accept an y interference received, including interference that may cause undesired operation.

Changes or modifications made to this equipment not expressly approved by Guangzhou ZHIYUAN Electronics Stock Co., Ltd.. may void the FCC authorization to operate this equipment.

Technical Supports

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