Phymax technology (Hong Kong) co., LTD

PM1282-868 Datasheet

Low-power wireless SPI interface module (868MHz) Excellent

LORA Spead-spectrum technique User Manual V1.0

Please read the manual carefully before using the module

Catalogue

1. Company Introduction

1.1 Disclaimer Text

On consideration of the differences of work environment and complexity & diversity of technology, the company ensures that the text descriptions is precisely right as far as possible but it is still difficult to rule out some inaccurate or incomplete descriptions. Therefore this text is only for reference and the company do not any legal commitment and guarantee. If any disagreement arises please contact us. Thank you.

1.2 Copyright Notice

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1.3 Company Introduction

Phymax technology co., LTD is a professional integrated high-tech enterprises which is engaged in wireless communication and sensing products' research&development, production, promotion, and engineering services. The company has a high-quality, professional and experienced R&D team whose education backgrounds are all master degrees or above, the international first-class university technology research team supports and covers 15 countries and regions' sales networking and system.

Phymax has independent intellectual property rights of multiband core technology of the wireless communication system. The earlier definition and construction of Internet of Things in this field consists of the intelligent service center based on Linux system, multi-level network transmission channel, multiple hops self-organizing mesh net, as well as extensible embedded nodes. The key point is the realization of the stable transmission of wireless nodes, through multi-frequency module, random frequency hopping media access protocol, self-healing network layer protocol and adaptive data transmission model technologies,ect, it creatively designed and implemented complete communication protocol on the basis of the only device address (GUA). The communication protocol became the basis of IOT system platform information transmission of WEM-A, in addition, it implemented the various IOT applications with unique data format and communication methods, making a breakthrough by solving the problem of the wireless node power supply; through the consumption optimization of node energy ,dynamic balance of network power, remote power-supervision and energy harvesting technology to achieve the very limited battery capacity to supply nodes for a long time working.

Phymax's wireless sensor series products have been widely used in dozens of domains such as petroleum chemical,water conservancy, electricity, railway, heat supply, transportation, factory automation, wireless meter reading, grain storehouse, vegetable base and forest fire prevention. Multi-level series wireless data transmission module can afford customers much flexibility of choices. Phymax's strong technical strength and project management skills ensure the company is able to successfully develop special products for customers or provide customized solutions.

Phymax is one of American SEMTECH's strategic cooperative partners, and providing network system solutions for their Lora RF chip.

Phymax will help its clients make more breakthroughs among the IOT industry with its advanced technology.

PM1282-868

2,Module Features

■FSK/GFSK , LoRa(Long Range) spread spectrum technique

■ Half-duplex communication

■ Excellent blocking immunity

■ Channel rejection ration(ADJ):56dBm

■ High RX sensitivity : -139dBm

■ IS multiband, free of charge with no need to apply for frequencies

■ Optional multi-frequency, multiple transmission rate,can be applied in FDMA and FM technologies

■Intelligent reset, low voltage monitor, timing wakeup, low-power mode,sleep mode

■ Low RX current: 12~13 mA

■ 256 Bytes FIFO TX/RX

■ ISSI channel detection

■ Transmission mode：FIFO / direct mode（recommend FIFO packet mode）

■ Configuration：AFC/air wakeup/low power/carrier sense/FEC error correction/AECencryption

3. Application

■ Remote control and data collection system

■ AMR(water meter, ammeter and gas meter) automated meter reading

■ Wireless handheld unit, oil field, mining area, construction site, factory

■ Industrial data collection, transmission and intelligent control

■ Wireless alarm system

■ Smart home system

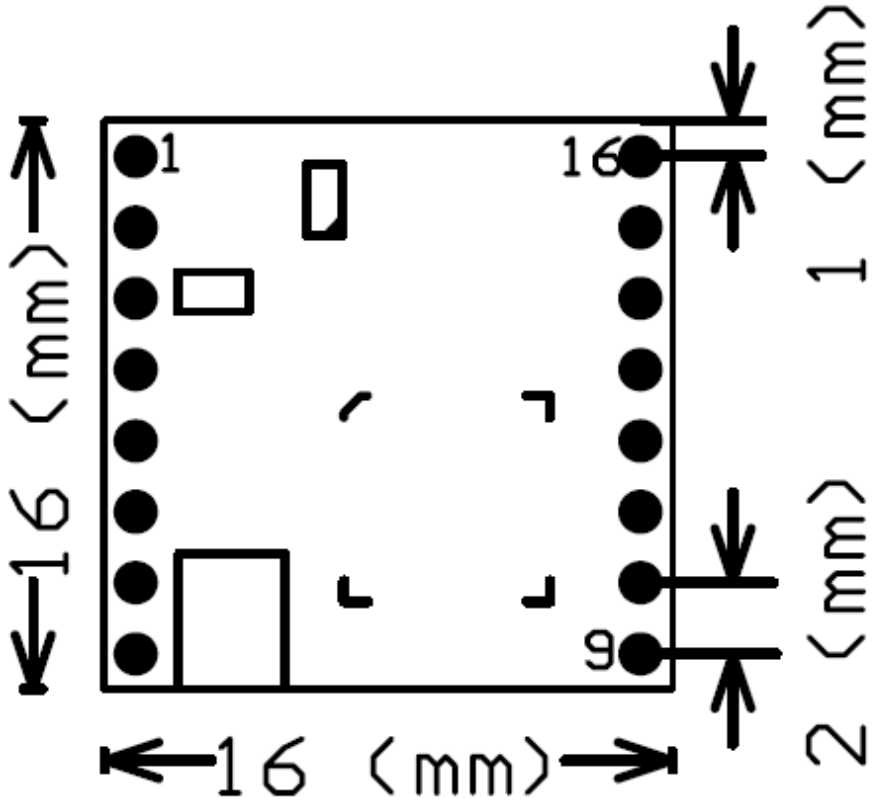
■ Baby monitor, Hospital calling system

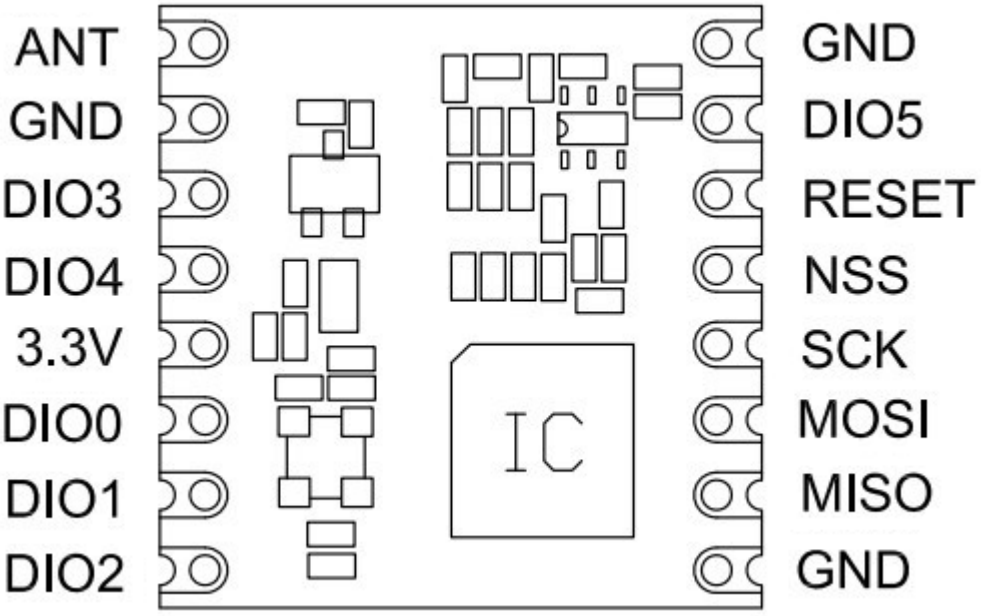
■ Wireless small amount data transmission

4. Electric Specification

Technical Index	Parameter	Remark
Working Voltage	1.8—3.6V	DC
Center frequency	868MHz	Other frequency can be customized
Frequency error	+/- 10ppm	
Modulation method	FSK,GFSK,OOK/LoRa TM	Programmable setting
Output power	Maximum 20 dbm	
RX sensitivity	-139dbm	@1.2kbps
RX current	10-12 mA	@1.2kbps
Emission current	<120 mA	@+20 dbm
Standby current	IDLE(1.5uA)/SLEEP(0. 2uA)	Reference operation mode
Transmission rate	0-300KHz	Programmable setting
Communication distance	5km / LoRa mode	
Antenna impedance	50ohm	
Working temperature	-40~+85°C	
Storage temperature	-40~+85°C	
Overall dimension	16 x 16 mm	

5. Module Size and Pin Definition




ANT
GND
DIO3
DIO4
3.3V
DIO0
DIO1
DIO2
IC
GND
DIO5
RESET
NSS
SCK
MOSI
MISO
GND

NO.	Pin Name	Type and Description	Remark
1	ANT	Antenna	
2	GND	Ground	
3	DIO3	Digital I/O port, can be customized,	
4	DIO4	Digital I/O port, can be customized,	
5	Vcc	Working power supply	3.3V
6	DIO0	Digital I/O port, can be customized	Can be selected
7	DIO1/CLK	Digital I/O port, can be customized, optional DCLK	For test sensitivity,floating
8	DIO2/DATA	Digital I/O port, can be customized	
9	GND	Ground	
10	MISO	SPI output	SPI data output
11	MOSI	SPI input	SPI data input
12	SCK	SPI clock	SPI clock input
13	NSS	SPI Chip select	
14	RESET	Chip reset	Chip reset input
15	DIO5	Digital I/O port, can be customized	
16	GND	Ground	

6. Application Notice

1、 Voltage cannot be out of the range of the module's power supply voltage 1.8 ~ 3.6V, if it is over 3.6V the chip will burn out. Recommending voltage is 3.3V.

2、 Module interface adopt semicircle bonding pad, all GND pin should keep reliable connection with digital ground of circuit.

3、 Antenna should keep away from system ground.

4、 MCU does not have SPI port single-chip and can imitate SPI time to carry out the read-write operation by using ordinary I/O port. SPI rate do not over 10MHz.

5、 If the power supply of MCU is 3.3V, it can connect with module without series resistance; if the power supply of MCU is 5V, 3.3V/5V level switching circuit should be accessed

6、 DIOO and DIO2 are common data I/O, can produce needed trigger signal according to application configuration

7、 In multichannel application, the channel spacing is 1MHz, if less than 1MHz it's easily to cause same frequency interference.

7.1 Remark

1. The communication rate of module will effect communication distance, the higher the communication rate is, the shorter the communication distance will be.
2. The communication rate of module will effect RX sensitivity, the higher the communication rate is, the lower the RX senstivity will be.
3. The power supply voltage will effect transmit power, within the allowable range of working power supply voltage, the lower the voltage is, the lower the transmit power will be.
4. The change of working temperature may cause the migration of the working frequency. It has no influence to the application as long as the temperature is within the working temperature range.
5. Antenna affect much to the communication distance, so should apply the antenna which matches module's frequency, standing-wave ratio should be small and impedance is close to 50ohm
6. The install position and method of module may effect communication distance.