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PRODUCT SPECIFICATION

Intelligent module product specification

Type: VZS2R1

Version: 2020224

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V 1.2	2020.02.25	issue	Chen jiatao
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I、 intelligent module VZS2R1 products

Model	Functional characteristics
VZS2R1	Temperature resistance: normal Operating voltage: 2.0V~3.6V Support protocol: ZigBee 3.0 Modulation mode: DSSS QPSK Operating frequency: 2400~2480MHz

II、 Overview of Intelligent Module Products

1 Product introduction

VZS2R1 is a ZigBee wireless communication intelligent module developed by Westphalia, which supports ZigBee3.0. Adopting the highly integrated wireless RF processor chip EFR32MG21A020 series of Silicon Labs, it has the advantages and characteristics of high wireless transmission power, strong receiving sensitivity, low power consumption and strong networking ability, which provides a perfect solution for ZigBee connection.

2 Technical parameters of products

technical parameter	parameter value
Chip model	EFR32MG21A020F512IM32-B EFR32MG21A020F768IM32-B
master control	High performance 32-bit 80MHz ARM Cortex®-M33
Flash	512kB / 768kB
RAM	64kB
Support agreement	ZigBee 3.0
Working frequency	2400 ~ 2480 MHz
Output power	Max：20dBm
receiving sensitivity	Max：-102.5dBm
modulation system	DSSS QPSK
operating voltage	2.0 V ~ 3.6 V
Sending current	Max：27mA（00dBm）
	Max：63mA（10dBm）
	Max：182mA（20dBm）
Receiving current	Max：10.91mA（250Kbps）
quiescent current	4.5mA (idle EM0)
	6.2uA (sleep EM2)
Standard security	AES 128/256
Working temperature	-40℃ ~ +85℃
ambient humidity	10% ~ 90% no condensation.
Technical certification	FCC & CE & SRRC

3 application area

- Wisdom lighting, illumination
- Wisdom campus
- Wisdom building
- Wisdom home furnishing
- Wisdom household appliances
- Wisdom socket
- Wisdom for the aged

4 naming rule

Note: Take the model of VZS2R1 module as an example:

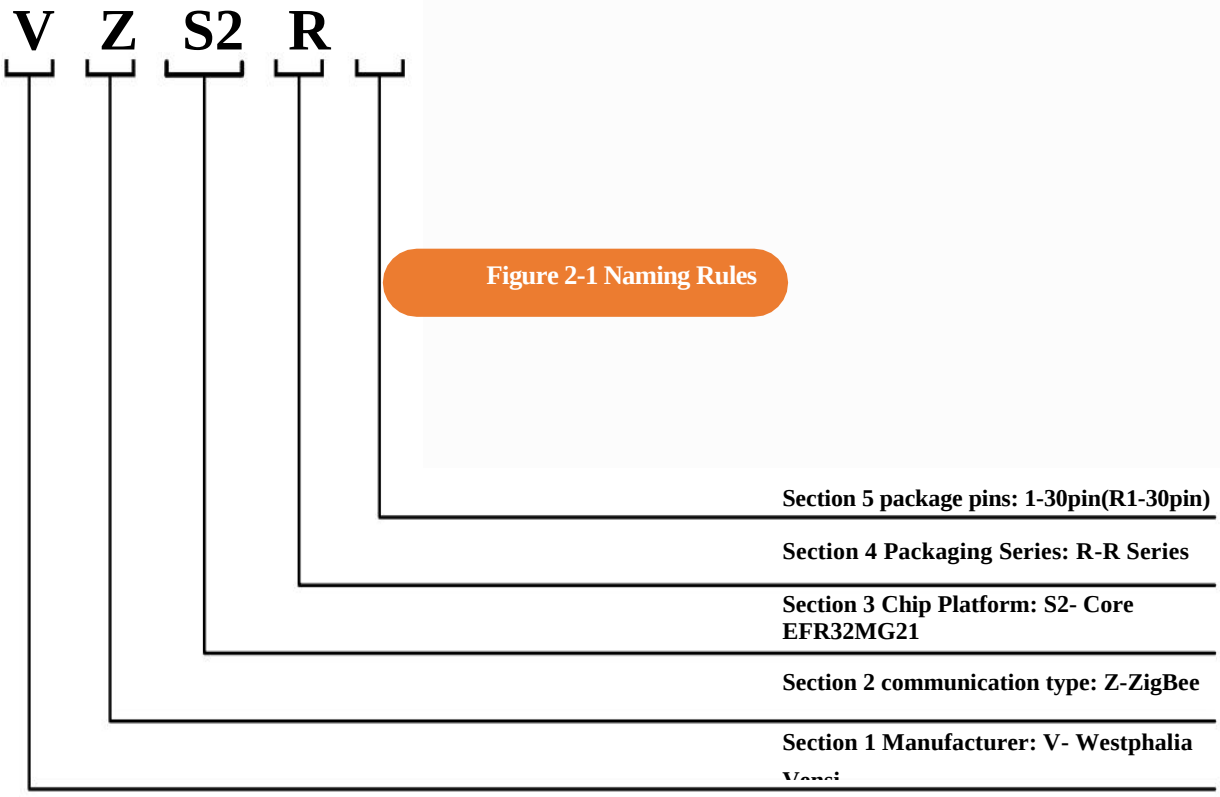

Figure 2-1 Naming Rules

III. Module Interface

1 Package size

1.1 VZS2R1

VZS2R1 has three rows of pins with a pitch of 1.27mm
Dimensions of VZS2R1: 15 0.4mm (L) x 18 0.4mm (W) x 2.8 0.2mm (H) The dimensions of vzs2R1 are shown in the figure:

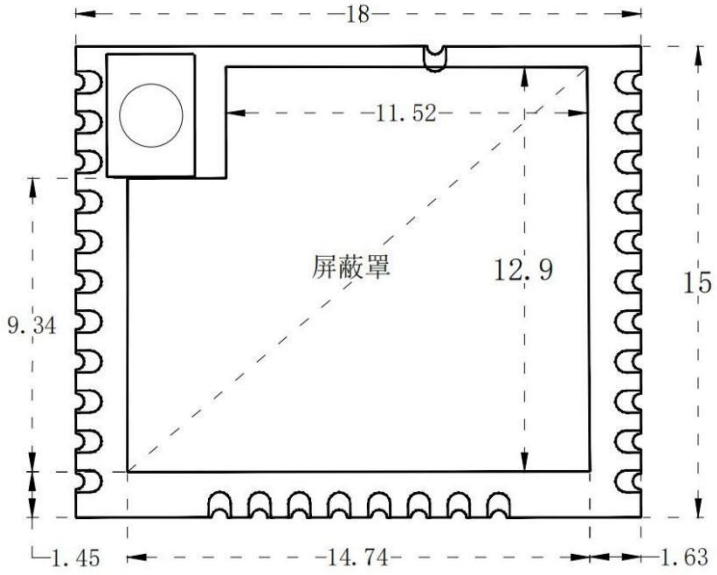

Figure 3-1 Front view of module with shielding cover

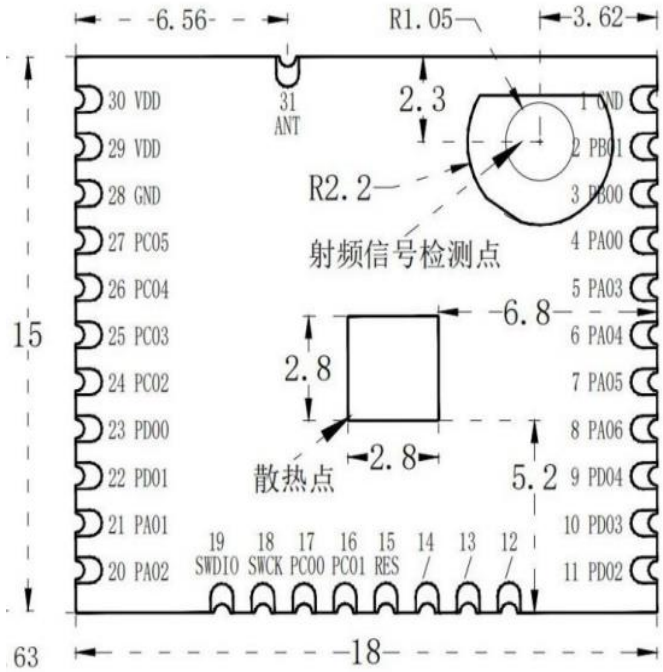

Figure 3-2 Back view of module with shielding cover

2 IO pin interface definition of module

Pin number		Chip function	Module function	function declaration
1	GND	GND/PAVSS	GND	ground connection
2	NULL	PB01(GPIO)	NULL	Use as GPIO
3	NULL	PB00(GPIO)	NULL	Use as GPIO
4r	NULL	PA00(GPIO)	NULL	Use as GPIO
5	NULL	PA03(GPIO)	NULL	Use as GPIO
6	NULL	PA04(GPIO)	NULL	Use as GPIO
7	NULL	PA05(GPIO)	NULL	Use as GPIO
8	NULL	PA06(GPIO)	NULL	Use as GPIO
9	NULL	PD04(GPIO)	NULL	Use as GPIO
10	NULL	PD03(GPIO)	NULL	Use as GPIO
11	NULL	PD02(GPIO)	NULL	Use as GPIO
12	/	/	/	/
13	/	/	/	/
14	/	/	/	/
15	RES	Hardware RESET	RESET	The system RESET signal is triggered at low level, and it is pulled up.
16	NULL	PC01(GPIO)	NULL	Use as GPIO
17	NULL	PC00(GPIO)	NULL	Use as GPIO
18	SWCK	DC/PA01	DC	DEBUG CLOCK
19	SWDIO	DD/PA02	DD	DEBUG DATA
20	PA02	DD/PA02	DD	DEBUG DATA
21	PA01	DC/PA01	DC	DEBUG CLOCK
22	NULL	PD01(GPIO)	NULL	Use as GPIO

23	NULL	PD00(GPIO)	NULL	Use as GPIO
24	NULL	PC02(GPIO)	NULL	Use as GPIO
25	NULL	PC03(GPIO)	NULL	Use as GPIO
26	NULL	PC04(GPIO)	NULL	Use as GPIO
27	NULL	PC05(GPIO)	NULL	Use as GPIO
28	GND	GND	GND	ground connection
29	VCC	PAVDD/RFVDD	VDD	DC power supply (1.85~3.6V)
30	VCC	PAVDD/RFVDD	VDD	DC power supply (1.85~3.6V)
31	ANT	Antenna	Antenna	aerial

Table 3-1 Pin Function Definition

3 DEBUG function

Pin burning function adopts pins 1, 15, 18, 19 and 30 (see Table 3-2 for functional description).

Pin number	Chip function	function declaration
one	GND	ground connection
15	Hardware RESET	Low level trigger, pull-up
18	DC	DEBUG CLOCK
19	DD	DEBUG DATA
30	VDD	Power supply (3.3V)

Table 3-2 Function of burning firmware

IV. RF parameters

1 Basic radio frequency characteristics

Parameter item	Detailed description
Working frequency	2.405~2.480GHz
ZigBee standard	IEEE 802.15.4
rate of data signalling	250Kbps

Table 4-1 Basic RF Characteristics

2 Launch performance

Parameter item	minimum value	typical value	maximum	unit
Maximum output power (250Kbps)	-	19.3	-	dBm
Minimum output power (250Kbps)	-	-15.2	-	dBm

Table 4-2 Launch Performance

3 receptivity

Parameter item	minimum value	typical value	maximum	unit
RX sensitivity (250Kbps)	-102.5	-102.3	-102	dBm

Table 4-3 Receiving Performance

V. Antenna information

1 Information

The antenna of this module can be IPEX antenna, Pin antenna, etc.

2 Reduce antenna interference

When using PCB antenna on ZigBee module, in order to ensure the optimization of ZigBee performance, it is recommended that the distance between the antenna part of the module and other metal parts should be at least 24.5mm The user PCB should not be wired or even copper-clad in the antenna area.

(Green marks are copper-clad areas, as shown in Figure 4-1), so as not to affect the antenna performance.

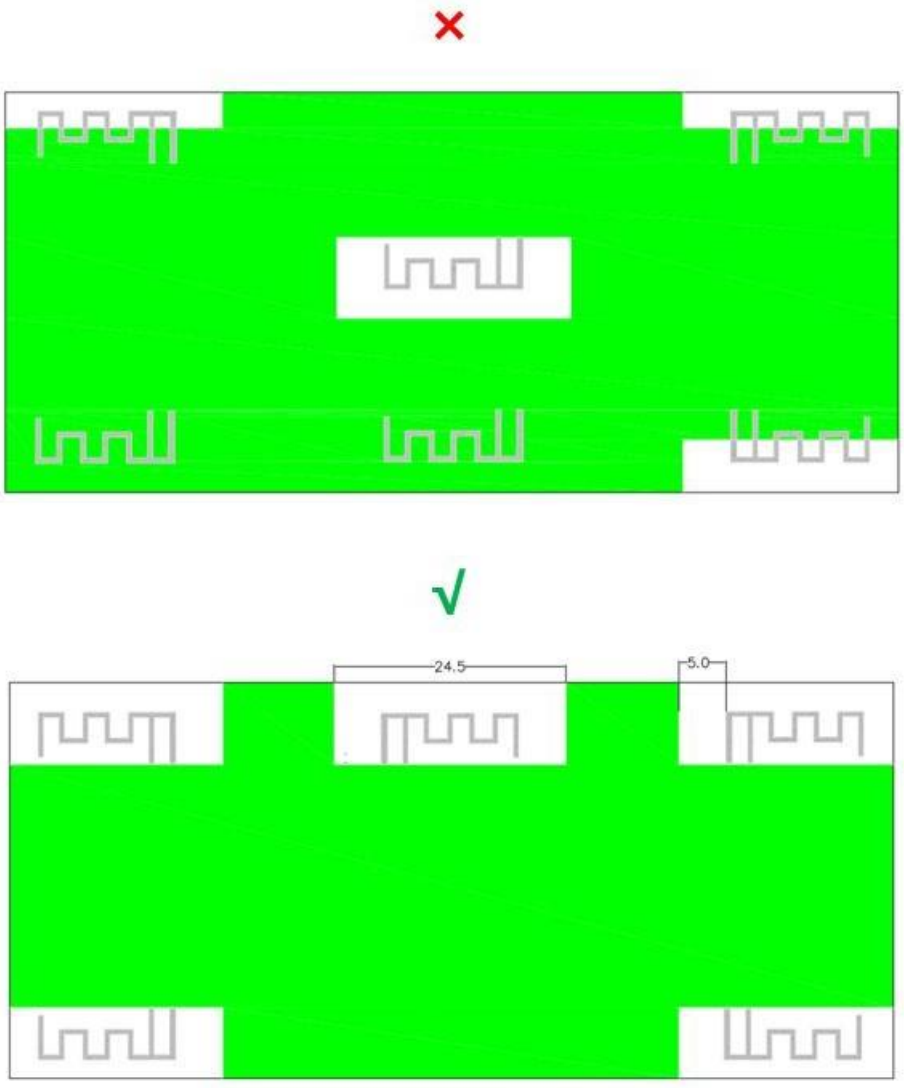

Figure 5-1 Antenna Interference Area

VI. Packaging Information and Design Reference

1 Mechanical dimensions

- The module size is: 15 x 18mm. Module size and pad size are shown in the figure.
- The dimension tolerance of the following modules is ±0.4mm

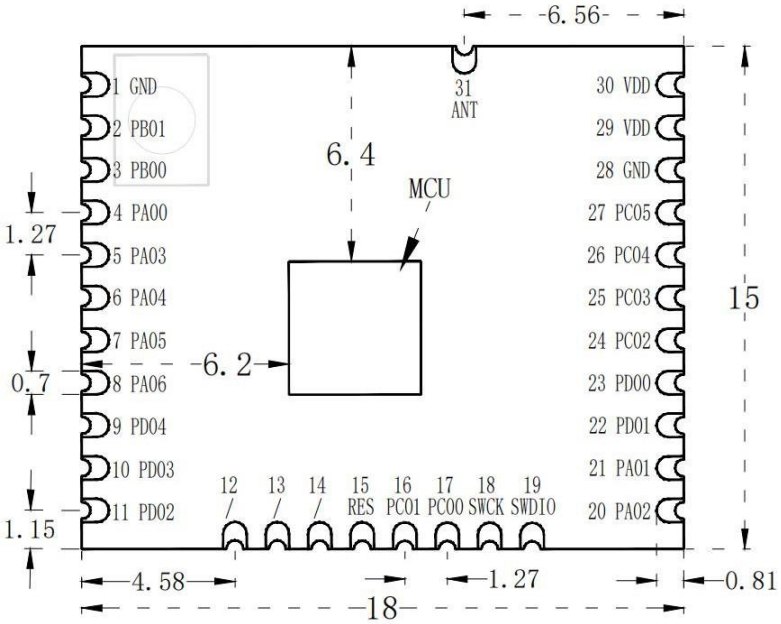

Figure 6-1 Mechanical dimension drawing

2 side view

2.1 VZS2R1- with shielding cover

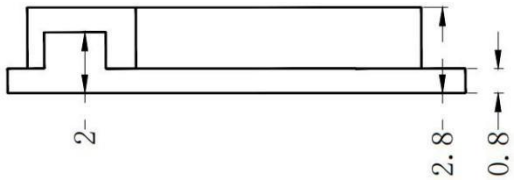

Figure 6-2 Side view of module with shielding cover

3 Reference drawing

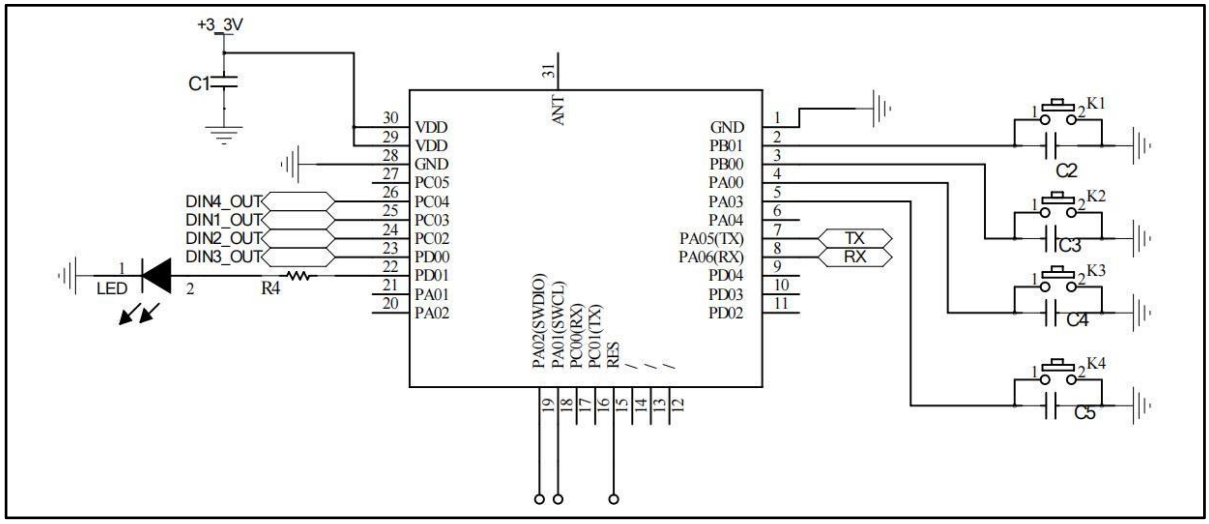

Figure 6-4 Design Reference Diagram

4 schematic circuit diagram

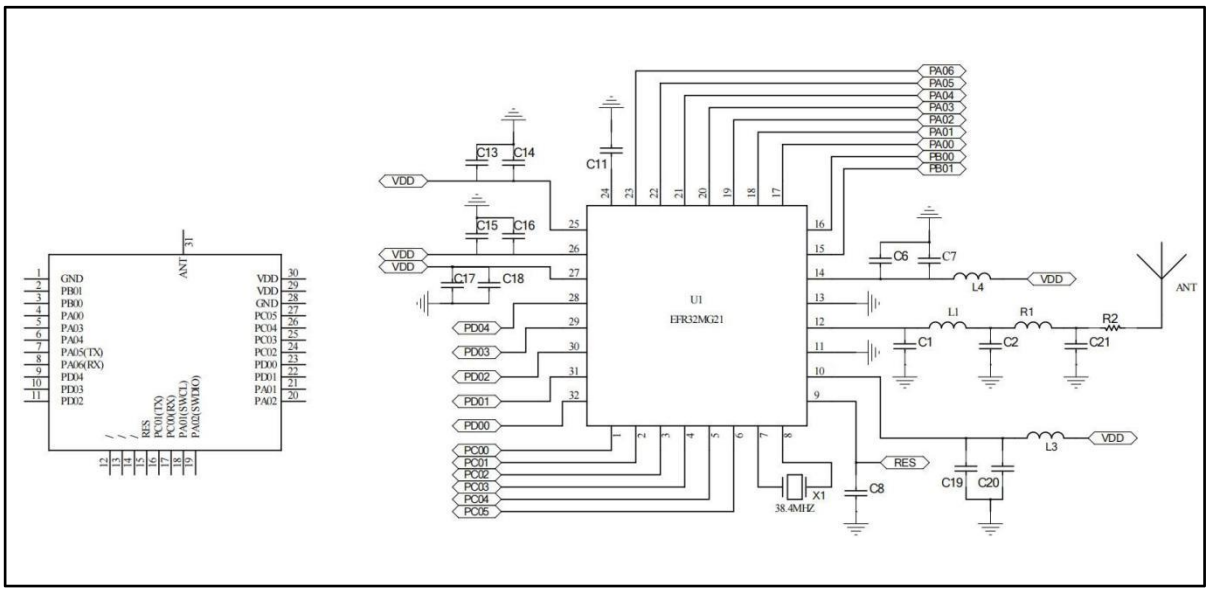

Figure 6-5 Circuit Schematic Diagram

5 PCB package diagram -SMT

5.1 VZS2R1- with shielding cover

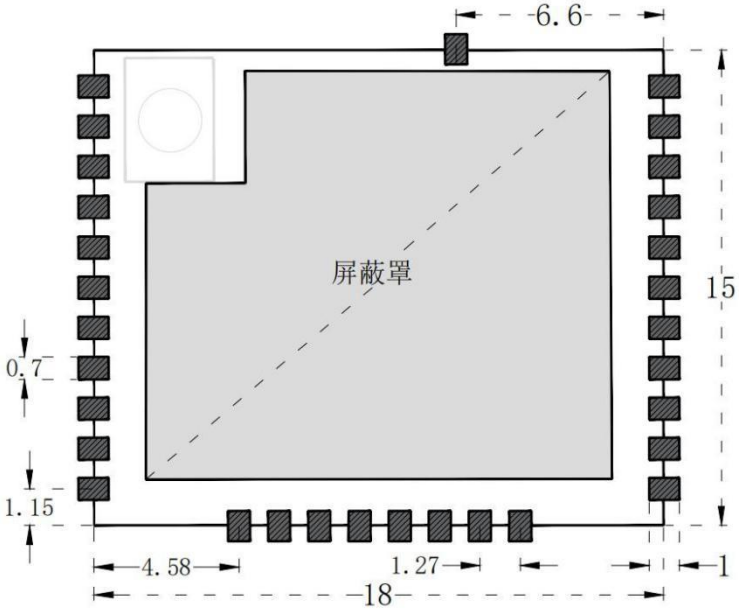

Figure 6-6 Front view of PCB package

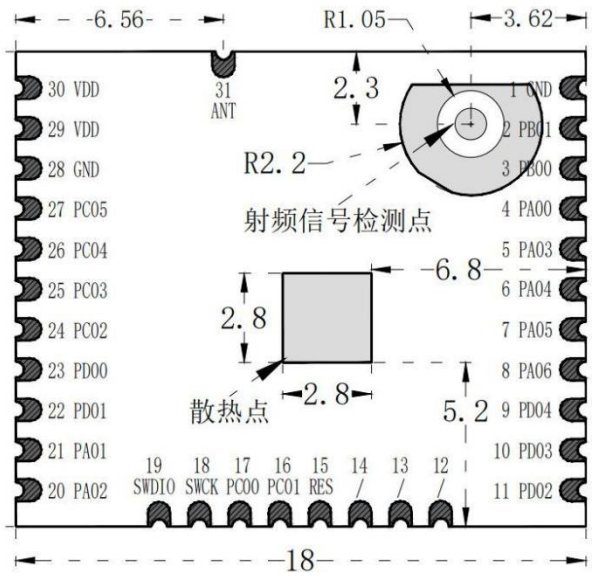

Figure 6-7 Back view of mechanical dimensions

VII. Matters needing attention in production

1 Shelf life of modules

a) Shelf life: 12 months, storage environment: temperature < 40℃, humidity < 90% R.H

b) Inventory control: the principle of "first in, first out"

2 Time limit for SMT assembly after the module is unpacked

a) Check the humidity card (as shown in Figure 6-1): the displayed value should be less than 20% (blue); If > 30% (red), it means that the module has absorbed moisture.

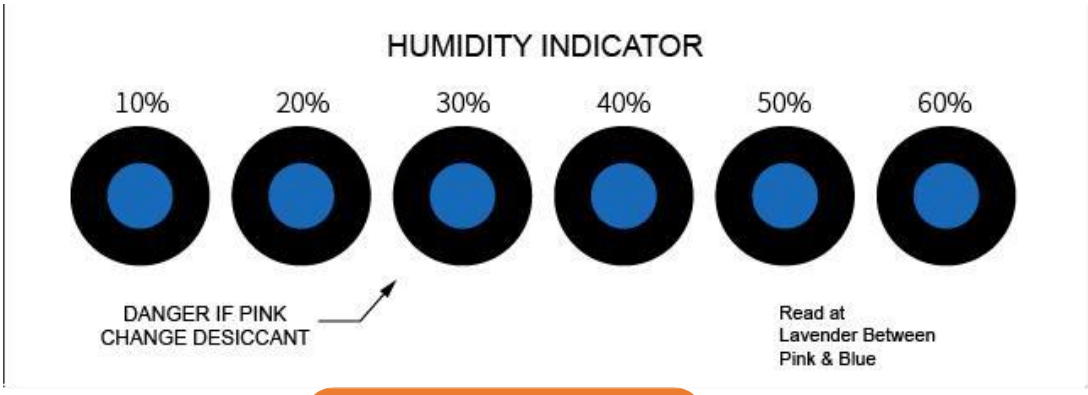

Figure 7-1 Humidity

b) Temperature and humidity control of SMT workshop environment: work at a temperature of 25℃ (4℃) and a humidity of 60% r.h (20%).

c) After baking, it can be used in SMT production immediately, or put in a proper amount of desiccant, then sealed and packaged, and stored in a drying cabinet.

3 Unpacked module, if not used up within 48 hours.

a) The module must be baked again to remove the moisture absorption problem of the module.

b) Baking temperature and time condition

- Baking temperature: 60℃ in reel packaging; Packing tray at 60℃
- Baking time: 8 hours in reel packaging; Pack the tray for 4 hours.
- If the exposure time after baking is more than 168 hours, please bake again.

VIII. MOQ of Module and Packaging Information

product model	MOQ (PCS)	Packaging method of blister tray		Packing method
		Number of modules per disk	Number of trays per box	Number of modules per disk
VZS2R1	1K	80PCS	25	1000PCS

Table 8-1 Package Information of Module

FCC STATEMENT

1. 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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

2. any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body

IX. Basic information

1 copyright statement

- The copyright of this manual belongs to Guangzhou Vistara Intelligent Technology Co., Ltd., and all rights of technical patents, specifications and definitions involved in all documents are reserved. Without the consent of Vistara Intelligent, no unit or individual is allowed to extract the contents of this manual without authorization.

2 disclaimer

- Due to product iteration, some content will be changed due to product iteration. Please contact our company in time for any understanding problems caused by product iteration. We will cooperate with customers to solve the problems encountered, but we will not be responsible for compensation for the increase of time and cost caused to customers. As some parameters come from the laboratory, some technical parameters involved in the content do not constitute a guarantee or backing guarantee in any practical application.

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