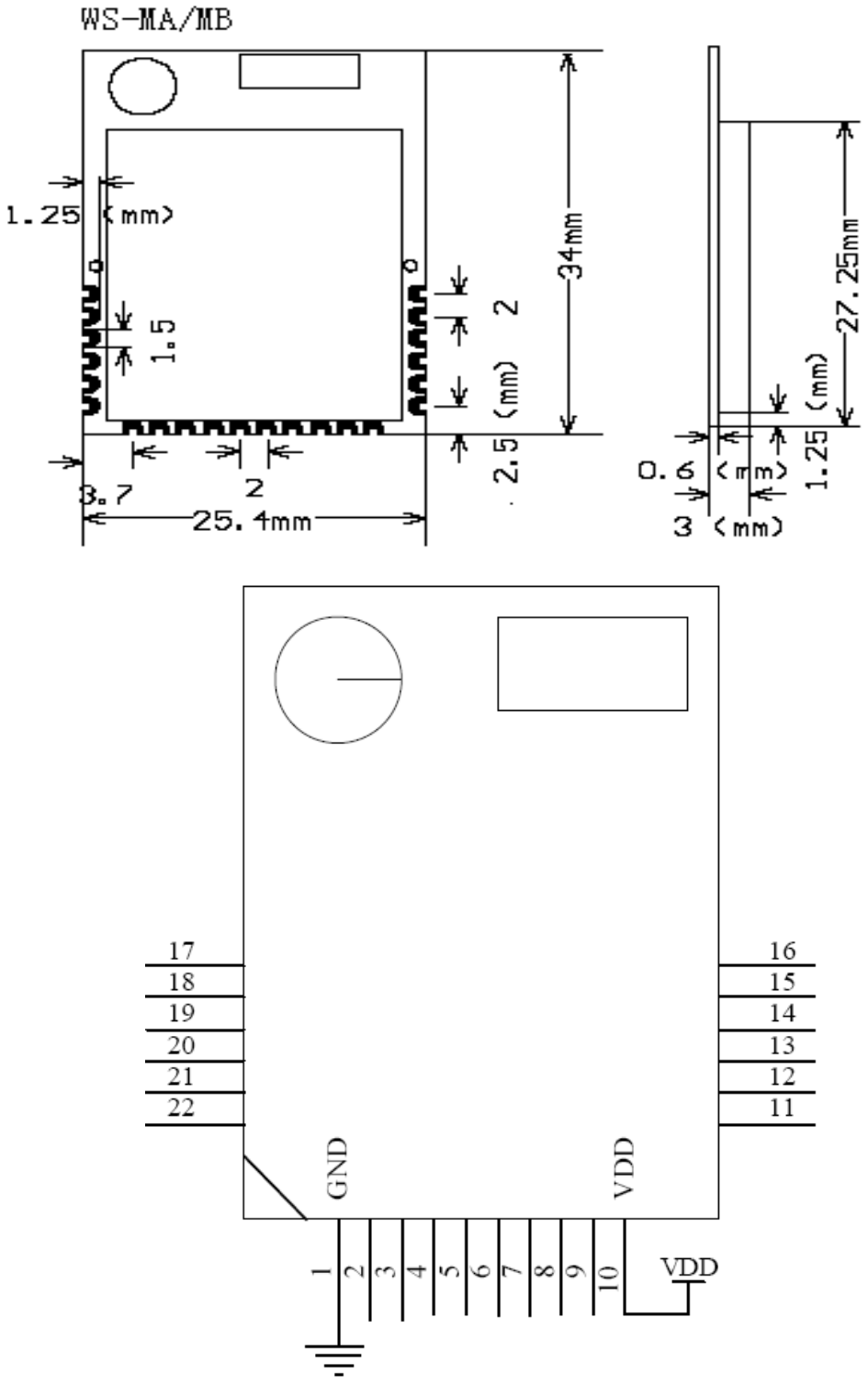
1、Hardware module

1.1 **Machinery size**



4.2 Technical guideline

low power consumption.

criterion		WS-MA
capability	room/city area	30Meter
	Outdoors RF Visual range distance	160m
	Output Power consumption.	1mW(0dBm)
	RF data transmit rate	250Kbps
	Receiver Sensitivity	-92dBm
power supply	Operation voltage(VDD)	2.7V-3.6V
	Ransmit current	31mA (type)
	Receive current	31mA (type)
	Sleep current	<10uA
currency	frequency	ISM 2.4GHz
	size	34×25.4×3(mm)
	Operation temperature	Industry temperature -40-85
	antenna choice	U.FL linker，chip antenna
network	Network topology. structure	star network、sector network equity network、mesh network
	channel ability	16 straight list channel (sortware choice)
safety	Filtration option	PAN ID、channel& fountain object address
	Data encrypt	SSL link、 data frames AES128 bit encrypt

4.3 Pinout overview

pin	Pinout overview
1	GND
2	
3	Digital I/O、timer、interrupt，4 mA drive capability
4	Digital I/O、timer、interrupt，4 mA drive capability
5	Digital I/O、timer、interrupt，20 mA drive capability
6	Digital I/O、timer、interrupt，20 mA drive capability
7	Reset, active low
8	Digital I/O、、ADC，4 mA drive capability
9	Digital I/O、、ADC，4 mA drive capability
10	2.0V-3.6V digital power supply for digital I/O
11	Digital I/O、、ADC，uart 0 receive(RX)，uart 1（CT）,SPI0（MI），SPI1(SS)，timer, 4 mA drive capability
12	Digital I/O、、ADC，，uart 0 send(RX)，uart1（RT），SPI0(MO),SPI1I timer, 4 mA drive capability
13	Digital I/O、、ADC、timer、uart 0(CT)，SPI0(SS)，SPI1(MO)，uart 1TX 4 mA drive capability
14	Digital I/O、、ADC、timer、uart 00(RT)，uart 1（RX），SPI0（C），SPI1(MI)，4 mA drive capability
15	Digital I/O、ADC，4 mA drive capability
16	Digital I/O、ADC，4 mA drive capability
17	DEBUG function pin DD
18	DEBUG function pin DC
19	Digital I/O、timer，4 mA drive capability

5、module indictate

5.indictate and list

SOP	CMD	LEN	DATA	FCS

- SOP： data mark region 1 byte；
- CMD： command region 2 byte；
- LEN： data region DATA length 1 byte；
- FCS： FCS check 1 byte；
  It is CMD region、LEN and DATA region data′ s FCS value。

*** module uart set：38400、8、N、1;**

Bayd rate 38400
Data length 8 bit
Stop length 1 bit
No check

Default dictate muster

COMMAND	orientation	explain	Apply part
WS_SYS_SET_CONFIG	down	Set node parameter	CM CA CS CE
WS_SYS_GET_CONFIG	Down	Take node parameter	CM CA CS CE
WS_SYS_CONFIG_ RESPONSE	Up	Node parameter reply	CM CA CS CE
WS_SYS_ RESET_NODE	Down	Reset node	CM CA CS CE
WS_NM_PING	Down	PING node	CM CA
WS_NM_PING_RESPONSE	Up	PING reply	CM CA
WS_NM_HOPPING	Up	single node PING	CM CA CS CE
WS_NM_HOPPING_RESPONSE	Up	single node PING	CM CA CS CE
WS_NM_DISCOVER_NODE	Down	Search node	CM CA CS CE
WS_NM_DISCOVER_ NETWORK	Down	Search network	CM CA CS CE
WS_NM_DISCOVER_NODE_RESPONSE	Up	Node Search reply	CM CA CS CE
WS_APP_GET_LOCATION	Down	Take orientation information	CM CA CS CE
WS_APP_ LOCATION _RESPONSE	Up	orientation information reply	CM CA CS CE
WS_APP_SEND_DATA	Down	Send data bundle	CM CA CS CE
WS_APP_DATA_ RECEIVED	Up	Receive data bundle	CM CA CS CE
WS_APP_GET_SPEED	Down	Test node capanility	CM CA CS CE
WS_APP_ SPEED _RESPONSE	Up	test data bundle reply	CM CA CS CE

Federal Communication Commission Interference Statement

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 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.

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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:

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.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.