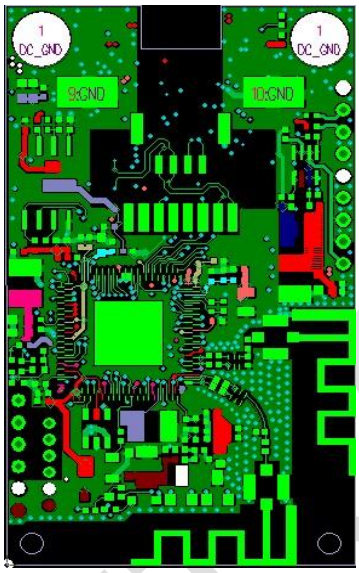
VM300-L and VM300-H Module Specifications

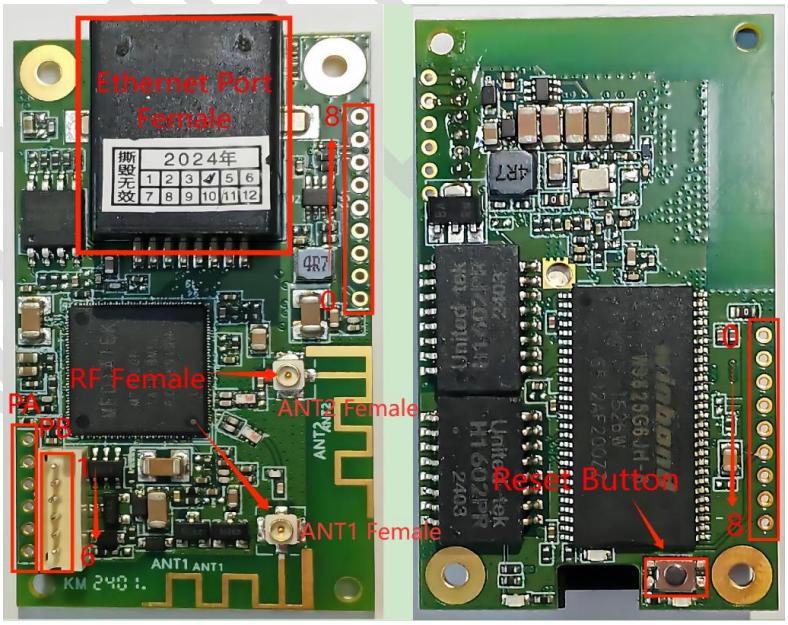
1. Features (PCB version: 9.0)

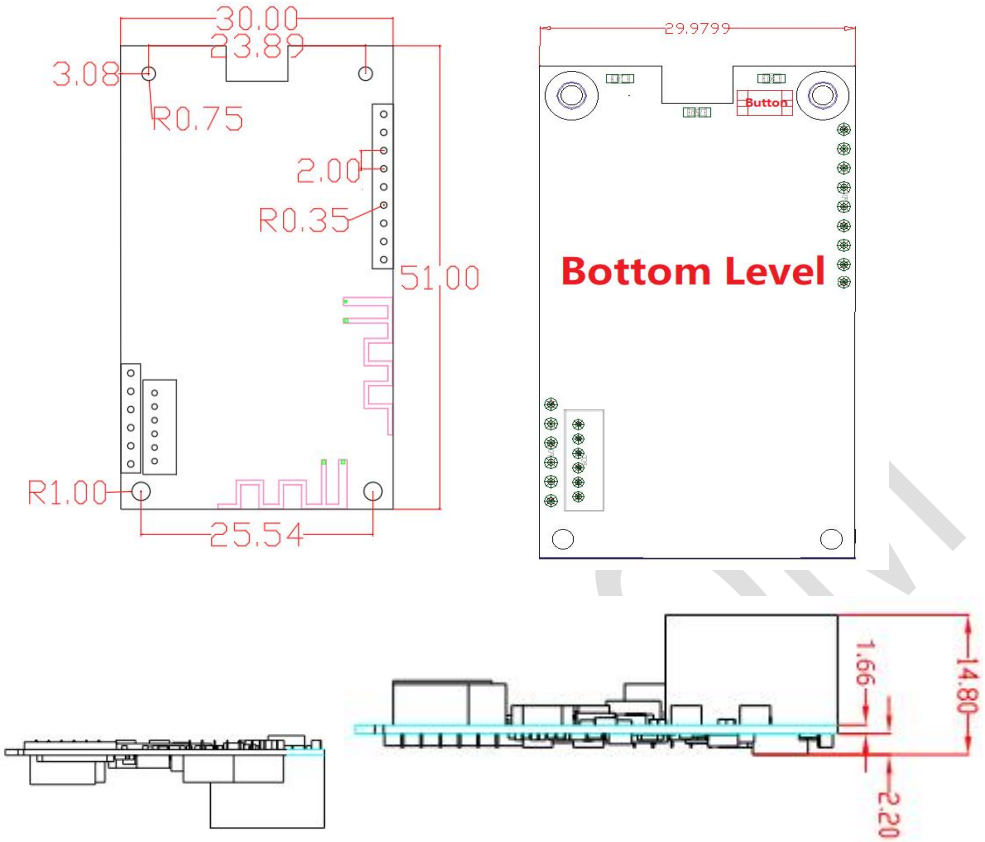
1.1 Hardware Features

- Top view screenshot:



- Module packaging：





Note: Because the module is too small, the four metal screws are easy to lead to deformation of the module, chip desoldering, it is recommended to use plastic screws, and only used to locate can be, to leave a little room for manoeuvre!

- Two hardware versions: Internal PCBA Antenna (VM300-L) and external antenna (VM300-H)
- Two external antenna RF female sockets (VM300-H only)
- Comes with a button to restore factory parameters
- Wide power supply working voltage: DC5V--DC24V
- 32MB SDRAM, can be expanded to 64MB; 4MB SPI Flash, can be expanded to 16MB (Byte)
- WiFi working frequency band: 2.4GHz, 2T2R dual antenna, 300MBps transmission rate
- Support 1--14 WiFi channels

- Rated average power consumption≥5W
- Module RF output power 14.5dbm/16dbm (two levels of output power can be optional)
- Support temperature compensation and frequency stabilization technology (TAFC) to ensure the stability of WiFi signal.
- Support 802.11b/g/n protocol
- Working environment temperature: -20℃-- 55℃

1.2 Function Features

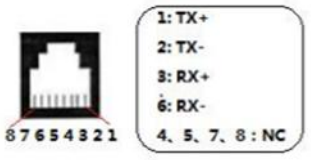
- Two software-controllable working modes: router mode, bridge + repeater mode
- Support intelligent transparent bridge mode, and support AP Client and AP Station at the same time
- Support VDNS technology, use domain name to log in to the configuration page in bridge mode
- The relevant parameters of the device can be configured through the WEB page configuration or the VCC mobile phone APP
- Software adjustable two-level WiFi RF output power (14.5dbm/16dbm)
- WiFi hotspot memory, maximum memory 100 hotspots;
- Support connecting more than 20pcs WiFi terminal at the same time;
- Support SSA 1.2 version signal strength remote center alarm protocol
- Support VONETS-Configuration Management Protocol V2.3 (confidential)
- Support transparent transmission of serial and network data (VONETS-UART_UDP or TCP data forwarding instructions 3.0)
- Online software upgrade

The main functional interfaces are as follows:

Female interface Subinterface	6PIN Female (PB)	6PIN Interface (PA)	9PIN Interface (PC)	RJ45 Female	Description
VIN+	√	√			DC5V--DC24V
WAN				√	Software control interchangeable
LAN	√	√			
WAN Status Indication			√		1. MOS tube open circuit output, built-in 330Ω limit flow resistance 2. Output current: 10mA
WiFi Bridge Connection Status Indication			√		1. MOS tube open circuit output, built-in 330Ω limit flowre sistance 2. Output current: 10mA
Reset Signal Input			√		Restore factory parameters
UART			√		Used for transparent transmission between serial port and network data
Power Enable (Computing)			√		Module power enable control pin, the default state is power enable. If the control voltage of this pin is less than 1V, the module power supply is off

2.Hardware Interface Details

Female Interface Subinterface	Hardware pin definition (PIN)			Description
	PA	PB	PC	
VIN+	6	6		DC5V--15V, the input voltage ripple is required to be less than 100mV, otherwise it will affect the WiFi transmission performance
GND	5	5	8、4	Module ground
LAN	1:RX+ 2:RX- 3:TX- 4:TX+	1:RX+ 2:RX- 3:TX- 4:TX+		PA and PB are parallel interfaces, but they are actually the same port (only one can be used at a time)
LAN Port Status Indication Output			3	1. MOS tube open circuit output, built-in 330Ω current limiting resistor 2. Output current: 10mA
WAN Port Status Indication Output			2	1. MOS tube open circuit output, built-in 330Ω current limiting resistor 2. Output current: 10mA
WiFi Status Indication Output			1	1. MOS tube open circuit output, built-in 330Ω current limiting resistor

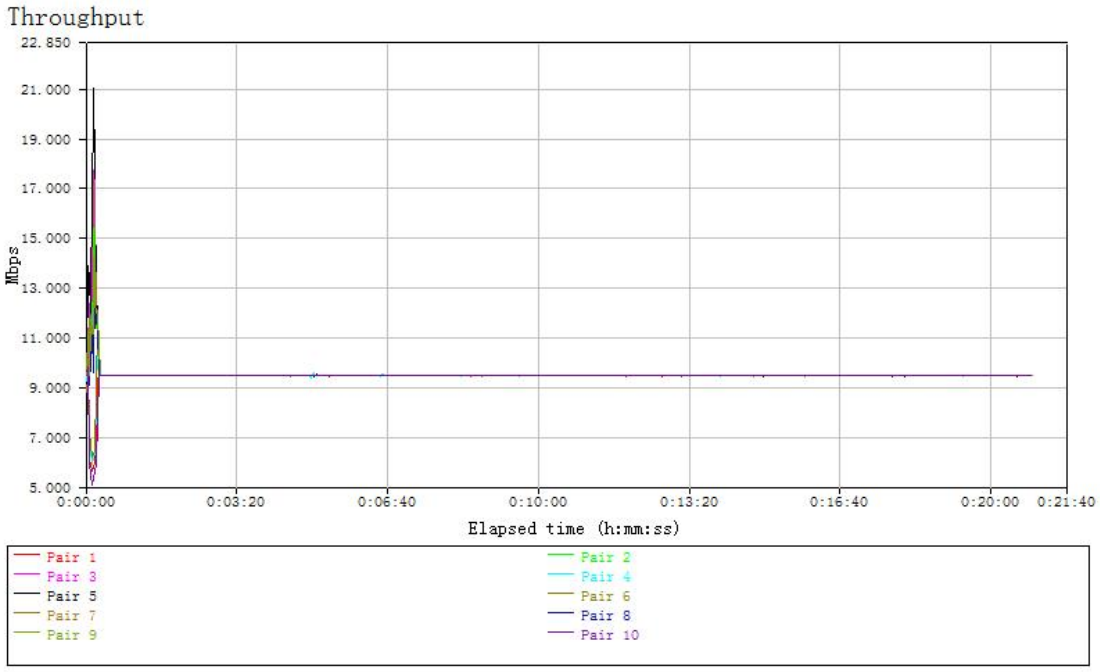
Female Interface Subinterface	Hardware pin definition (PIN)			Description
	PA	PB	PC	
				2. Output current: 10mA
Reset Signal Input			5	After the module works normally, keep the low level for more than 3 seconds, the module will restore the factory parameters (less than 0.6V is the low level)
UART-TX			6	TX signal line of UART used for serial port transparent transmission, TTL level output
UART-RX			7	RX signal line of UART used for serial port transparent transmission, TTL level input
Power enable pin			0	Module power enable control pin, the default state is power enable. If the control voltage of this pin is less than 1V, the module power supply is off
Standard RJ45 female socket pin definition reference				
Receive sensitivity threshold	-69dbm			

3.Electrical Performance Parameters

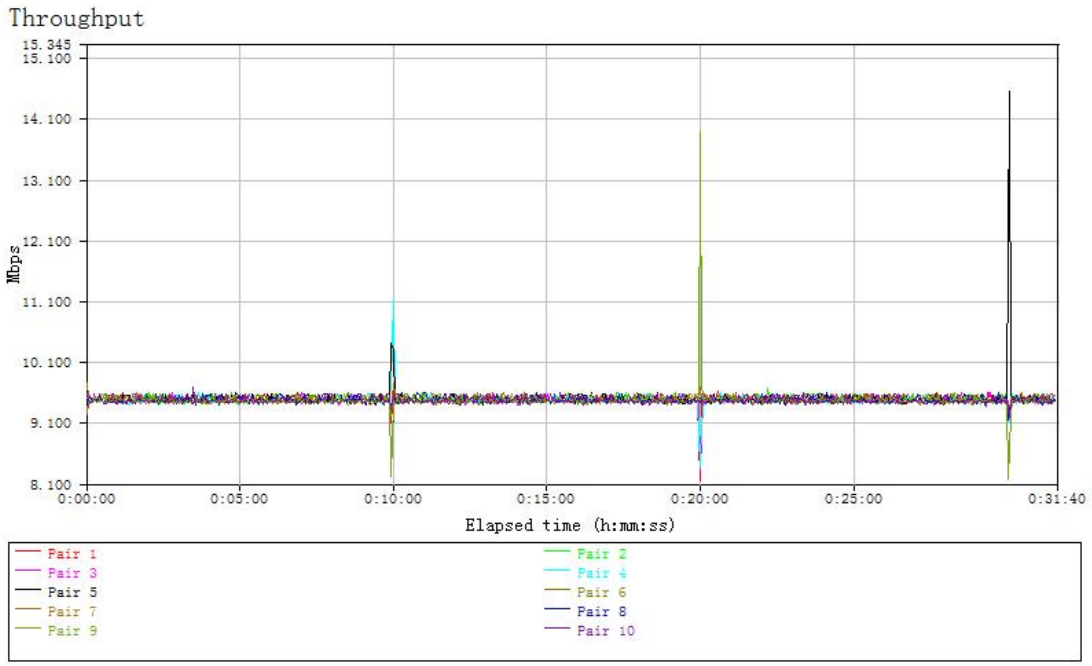
1. Power Supply Parameters				
Supply voltage range	Input power	Typical power supply	Power ripple	Protection voltage upper limit
DC5V-24V	≥5W	5V/2A	＜100mV	29V
2. Measured table of performance parameters of working electrical appliances (aMBient temperature: 27℃)				
Supply voltage	Work Stage	Working current (mA)	Main chip temperature (℃)	
5V	Booting	80-270	27-43	
	Standby	180-259	46	
	transfer data	450-580	70	

4.Network throughput test

- VM300-L throughput test fluctuation graph:



- VM300-H throughput test fluctuation graph:

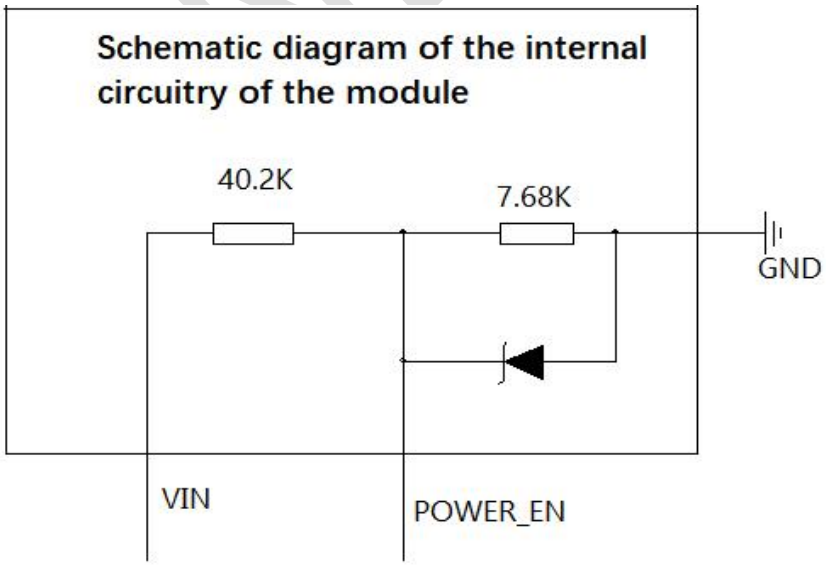


5. Supplied accessories

- Two 3dBi external antennas of VM300-H with RF cable buckle

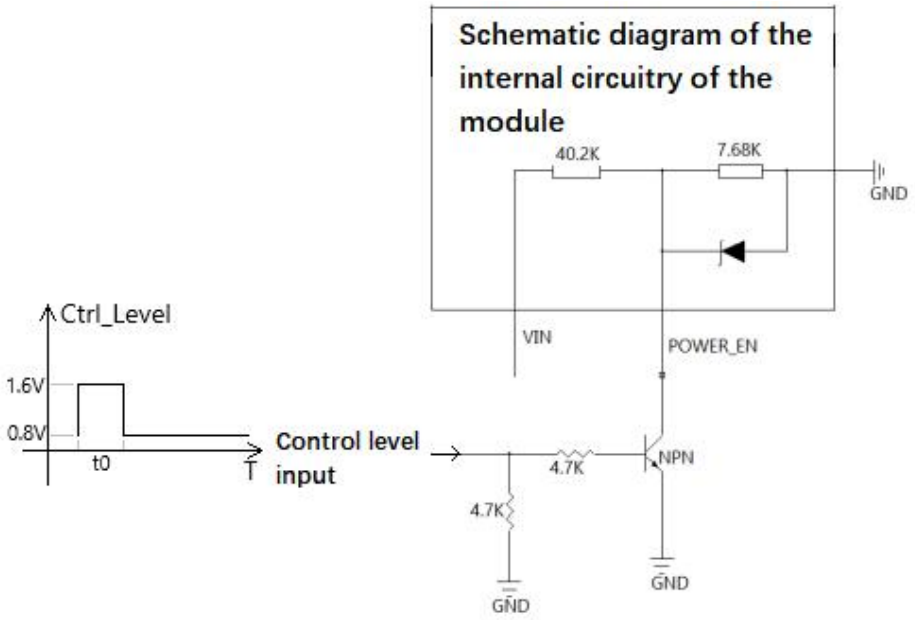
6. Common problems:

When using a non-independent power supply such as battery or motherboard to supply power to the module, the voltage may be unstable or have a large peak value at the moment of power supply startup, at this time, it is easy to damage the configuration parameters in the flash memory of the module. It is recommended to do a delayed start for the module, until the power supply voltage stabilizes before supplying power to the module. Module POWER_EN pin (PC-0) description is as follows: external control circuit will POWER_EN pin to a low level (1.0V or less) to close the module power supply; POWER_EN pin to a high level (1.6V or more) to open the module power supply.



The control module delayed start circuit reference design has the following two options:

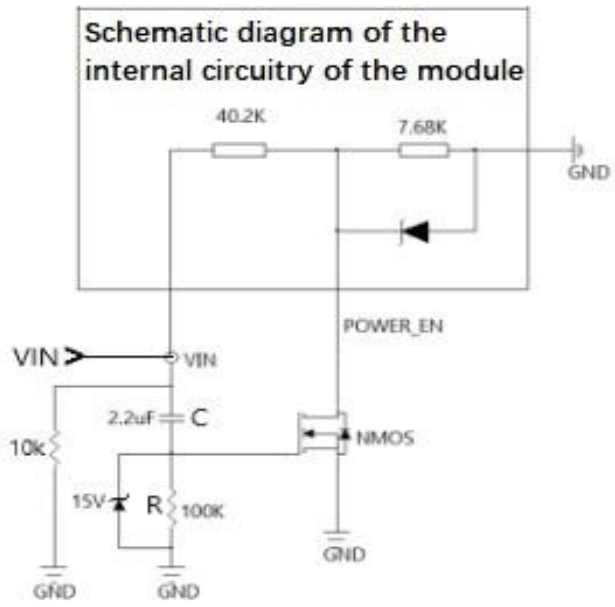
- Reference design 1



POWER_EN foot and GND access module, MCU connected to the microcontroller, the motherboard power-up so that the control level output high, transistor conduction, POWER_EN foot is low, the module does not start; power supply stabilization so that the control level has been at a low level, the transistor cutoff, the POWER_EN foot is a high level, the module is normal operation.

The above figure t0 is the length of the delayed start.

- Reference Design 2



VIN, POWER_EN foot and GND access module, motherboard power-up VIN to capacitor C charging, at this time the MOS tube conduction, POWER_EN foot for the low level, the module does not start; capacitor C is full of MOS tube cutoff, POWER_EN foot for the high level, the module starts. Resistor R is used to adjust the capacitor charging time, the larger the resistor charging time is longer delay start time is longer, 10K resistor is used for frequent unplugging and plugging the power supply when the capacitor discharges, 15V regulator is used to protect the MOS tube and capacitor rapid reverse discharge. The approximate formula for the length of the delay is: T = 1.4RC