VHA300_1V0 Smart Home WiFi Module Specification

1.Features

  1.1 Hardware features

    ● Module outline:
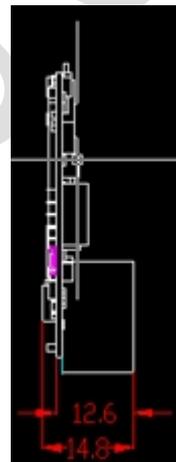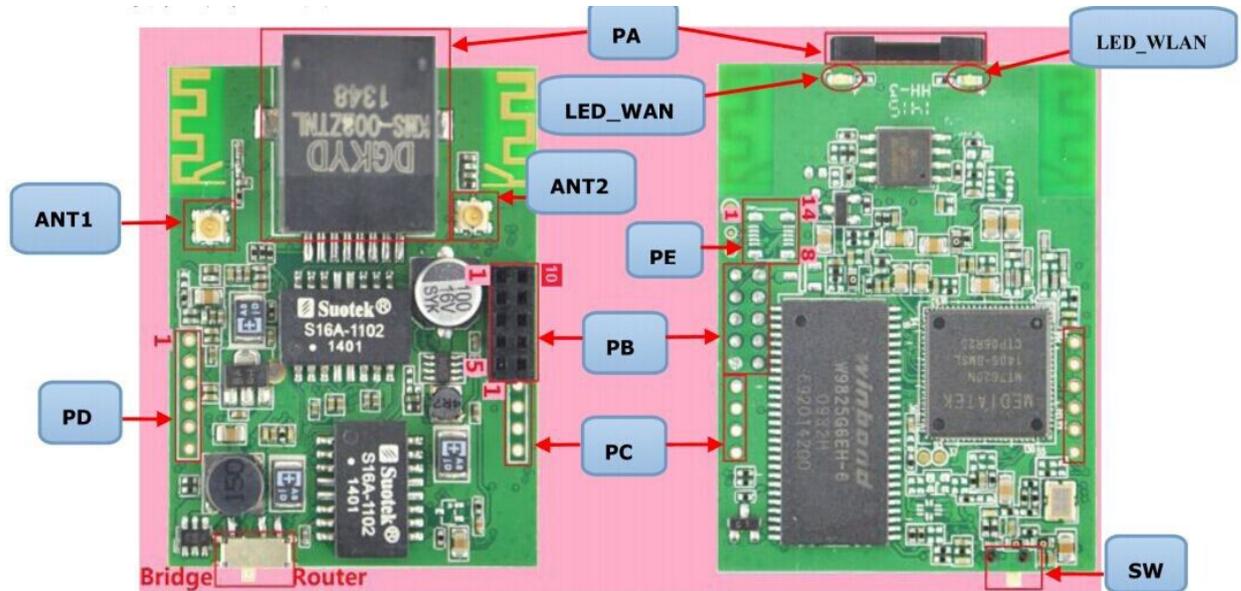
- ● A standard RJ45 female PA (In Router mode, it is WAN port)
- ● A 10PIN more functions interface PB, it can be connected to VPM2000 power supply module plate with a pin, to achieve AC110-220V power supply, the sub interface description is shown in the below form:

Sub interface	Description
VIN	DC5--15V Power input inferface
LAN	The standard ethernet LAN port

USB HOST	Used for connecting 3G/4G USB modem
Reset	The switch of reset to factory

- A TTL Level of 4 PIN GPO output interface **PC**, to achieve PWM output;
- A 5PIN SPI interface **PD**, can used to connect various sensors or communication with the host computer
- A DC5V-15V power supply(the same voltage as VIN of **PB**) of touch button chipset interface **PE**, can be used to connect the touch key board or an ordinary key board
- An option switch **SW** for WiFi router and WiFi Repeater operating mode, used to set the operating mode of the module to meet the needs of different applications;
- A WiFi status indicator **LED_WLAN**, a WAN port status indicator **LED_WAN**;
- Two on-board PCB antenna
- Two female RF connector external antenna (50Ω) **ANT1, ANT2**, after connecting an external antenna, it will automatically disconnect on-board PCB antenna
- Main chip: MT7620N, clocked of main chip: 580MHz;
- 32Mb SDRAM,can be extended 64Mb; 4Mb SPI Flash, can be extended 8Mb/16Mb(Byte);
- WiFi working frequency: 2.4GHz，2T2R dual antenna，MIMO technology 300Mbps transmission rate.
- Support 1-14 WiFi channels.
- The average power consumption is less 0.9W;
- Output power of Module RF :15dbm--16.5dbm
- Adopt the original creation D/A temperature compensated auto frequency control technology（TAFC）,make sure the lasting stability to ensure that the WiFi signal is not dropped.
- upport 802.11b/g/n mode.
- Operating ambient temperature: -25℃ ---- 55℃.

1.2 Function Features:
- Support open-wrt-2.6.36 for VONETS, facilitate   open-wrt lovers to develop various types of WiFi products;
- Built-powerful VNET-FREE smart home control protocol service software, no need to change the module software, simply press the VNET-FREE Mobile APP to control protocol design software, you can achieve all kinds of WiFi smart home products, such as:
  ✧ Smart WiFi Repeater + Socket

- ✧ Smart embedded in the wall WiFi repeater together with USB Fast Charger
- ✧ Smart WiFi Lamp
- ✧ Smart WiFi Touch Switch
- ✧ Smart embedded in the wall WiFi repeater + Socket
- ✧ Smart WiFi-controlled IR repeater
- ✧ Smart WiFi curtain switch
- ✧ more...

- Two switch controlled operating mode: Router mode, WiFi repeater mode (including bridge mode)
- Support intelligent transparent bridge mode, also support AP Client and AP Station, facilitate the establishment of tree WiFi network to solve a small star traditional WiFi network coverage problems, make the same WiFi network as ZigBee, smart home system can be easily applied, and WiFi network as a standard IP networking, and its control , communications, development was significantly better than ZigBee;
- Built-in WEB configuration services, available configure module parameters through the web
- Support VDNS technology, in bridge mode, can be configured via logging on the domain login page, solve the problem that configure and secondary development.
- Support firmware upgrade online.

2. Hardware interface definition and application development comments

2.1 Hardware interface pin definitions, function

Pin Function	Interface Pin Definition					Function Description
	PA	PB (10PIN)	PC (4PIN)	PD (6PIN)	PE (14PIN)	
USB Host		1:VIN+ 7:USB_D+ 8:USB_D- 6:GND				USB Host（VIN+ is DC5V) Used to connect 3G/4G USB Modem, achieve MiFi router function signal accessed by GSM, GPRS, 3G/4G signal access.
PWM OUT		2:GPIO_16 3:GPO_02 4:GPO_19 5:GPO_18	1:GPO_18 2:GPO_19 3:GPO_02 4:GPIO_16		2:GPIO_43 12:GPIO_41 13:GPIO_42	1.GPO_18、GPO19、GPO_02 built-in 4.7K-OHM pull-down resistor; 2. TTL level output, PWM pulse frequency is

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						adjustable, pulse period to TICK basic unit (1TICK = 1ms); 3. Can control PWM pulse width and frequency by VNET-FREE control protocol. 4.To start the GPIO function of PB, the LAN port function on PB should be closed, it must be changed by the original VONETS during factory.
SPI				1:SPI_CLK 2:SPI_CS1 3:SPI_MISO 4:SPI_MOSI 5:3.3V_OUT 6:GND		1. The standard SPI interface, used to secondary development, connecting every kinds of sensor or PC to expand variety of applications. 2. The maximum output current of 3.3V_OUT is 300mA.
TOUCH KEYPAD (BCD ENCODE)					9: KEY_IN0 10:KEY_IN1 11:KEY_IN2	1.KEY_IN0 corresponding GPIO_17; 2.KEY_IN1 corresponding GPIO_20; 3.KEY_IN2corresponding GPIO_21; 4. This is the touch keyboard BCD coded input interface, application specific programming methods are detailed in the reference;
TOUCH KEYPAD (PIN MAP)					9: KEY_IN0 10:KEY_IN1 11:KEY_IN2 2:KEY_IN3 12:KEY_IN4 13:KEY_IN5	1.KEY_IN3 corresponding GPIO_43; 2.KEY_IN4corresponding GPIO_41; 3.KEY_IN5 corresponding GPIO_42;

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						4. There are two input methods for TOUCH KEYPAD : BCD code and PIN MAP way, when using PIN MAP way, each keystroke corresponding each KEY_IN input level;
KEYPAD_PW_EN					5	Corresponding GPIO_39, used to controlling the power supply of the keyboard board, built-in 4.7K-OHM, pull-down resistor, TTL level output.
WAN	RJ45 Female port					1. When the module is operating in WiFi router mode, it is as WAN port; 2. When the module is in 3G router mode, it is as LAN port; 3. When the module is in Bridge mode, it is as LAN port.
LAN	2:TX- 3:TX+ 4:RX- 5:RX+					The sub-interfaces LAN on PB interface, with standard RJ45 female correspondence between the following diagram:
VIN+	1					1. Module positive power supply; 2. Input voltage: DC5V - 15V; 3. Power supply input power: 2.5W.
GND	6		6		1、4、6、7、8、14	Negative power supply module
Reset （Power on/off）	9				3	1.Built-in 100K-OHM pull-down resistor
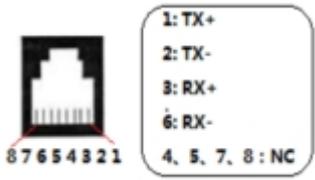
|					2. Used to reset or turn on/off
NC		10			Reserved Pin, don't use

2.2 Reset and turn on/off signal pin
- Restore the factory and switch modules use the same signal pin(PE.3 and PB.9)
- In the module turned off, the Reset pin input a width greater than 1 second positive pulse, the module start work

- After the module is start up, if Reset pin input a positive pulse that is less than 500ms (short press), the module power shutdown, then the module is power off and shutdown.
- Restore factory has two reset modes: normal mode and hotel mode, the factory default mode is normal, you can modify the reset mode through the WEB configuration page.
  - 2.2.1 Choose the normal mode, if Reset pin input a positive pulse that the width is greater than 3 seconds(long press), then the module will reset to the factory default parameters.
  - 2.2.2 Choose hotel mode, if Reset pin input a positive pulse that the width is greater than 3 seconds(long press), the LED_WLAN will light, the module enters the hotel reset mode, then on the Reset pin for the
    continuously of two positive pulse is less than 500ms (fast short by two times), the module will reset to the   factory default parameters.
  - 2.2.3 After the module enter the hotel reset mode, if Reset pin input a positive pulse that the width is greater than 3 seconds(long press), then the LED_WLAN stop the quick blink, the module exit reset mode to normal mode.

2.3 Operating mode switch SW
- SW switch signal pin is correspond with GPIO_16, only use for the input signal at start up, built-in pull-down resistor 4.7K-OHM, which is used to select the operating mode of the module
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GPIO_16 Level	Working mode
High Level 1	Bridge
Low level 0	Router

- When the module started normally, GPIO 16 (PC PIN4) work in output mode, used as PWM control signal output(TTL level), then the built-in pull-up or pull-down is depending on the direction of SW.

2.4 With VHA300 to achieve WiFi LED dimming output(PWM) Application Reference

- Application topology
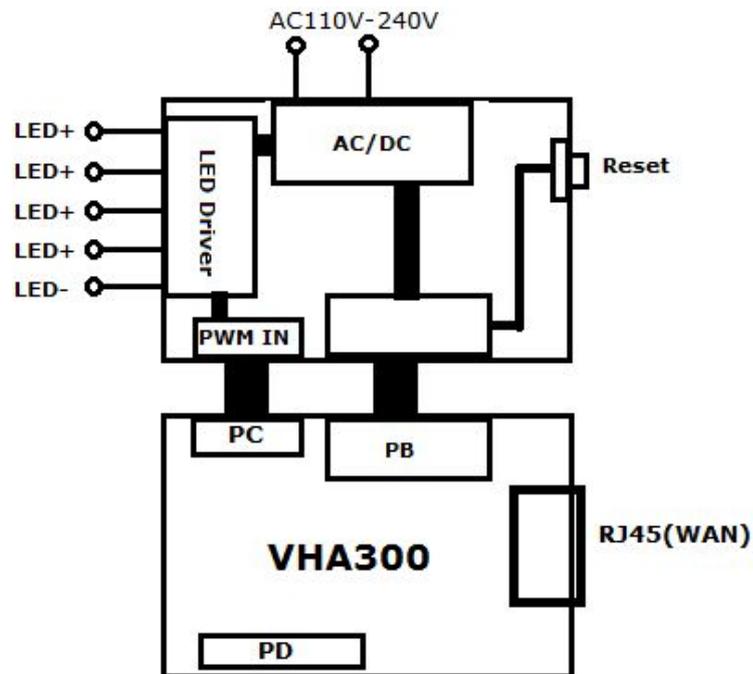
- Control terminal software can be based on any operation, it is just based on TCP / IP to use VNET-FREE intelligent home control software to write software
- VHA300 own software is no need to be changed, all the parameters are set by VNET-FREE Control Protocol

2.3 With VHA300 and VPM2000 to achieve WiFi touch switch applications
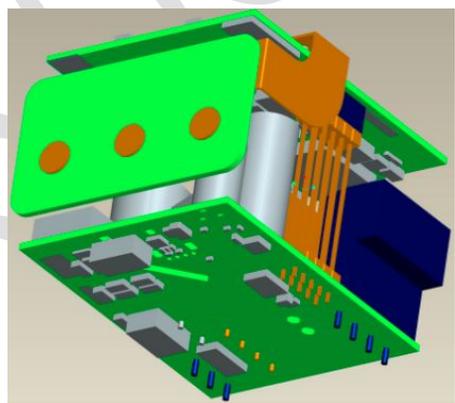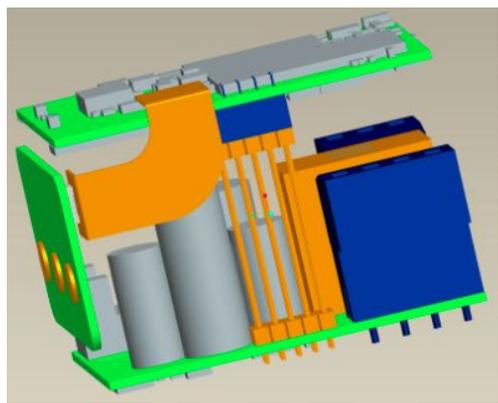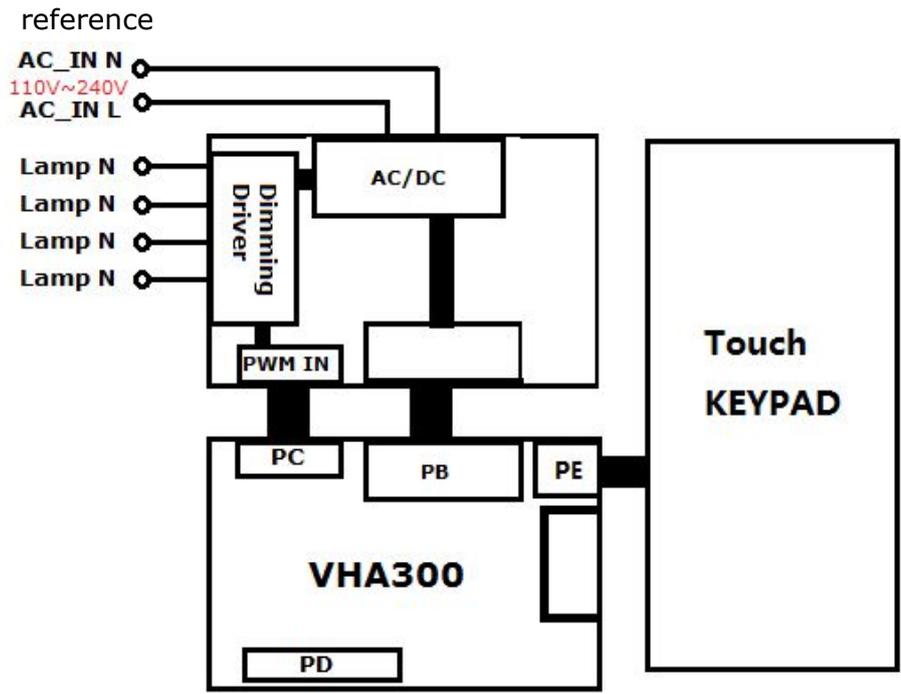
reference

2.5 With VHA300 and VPM2000 to achieve embedded wall WiFi repeater or WiFi router application reference

VHA300
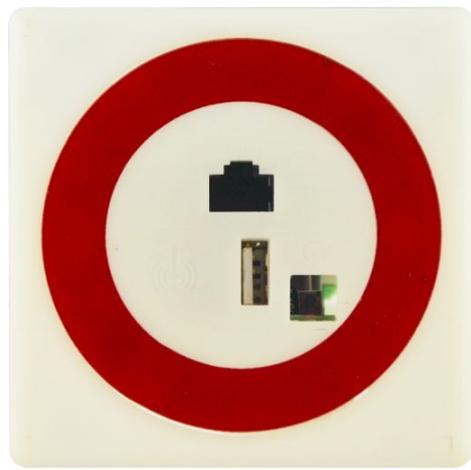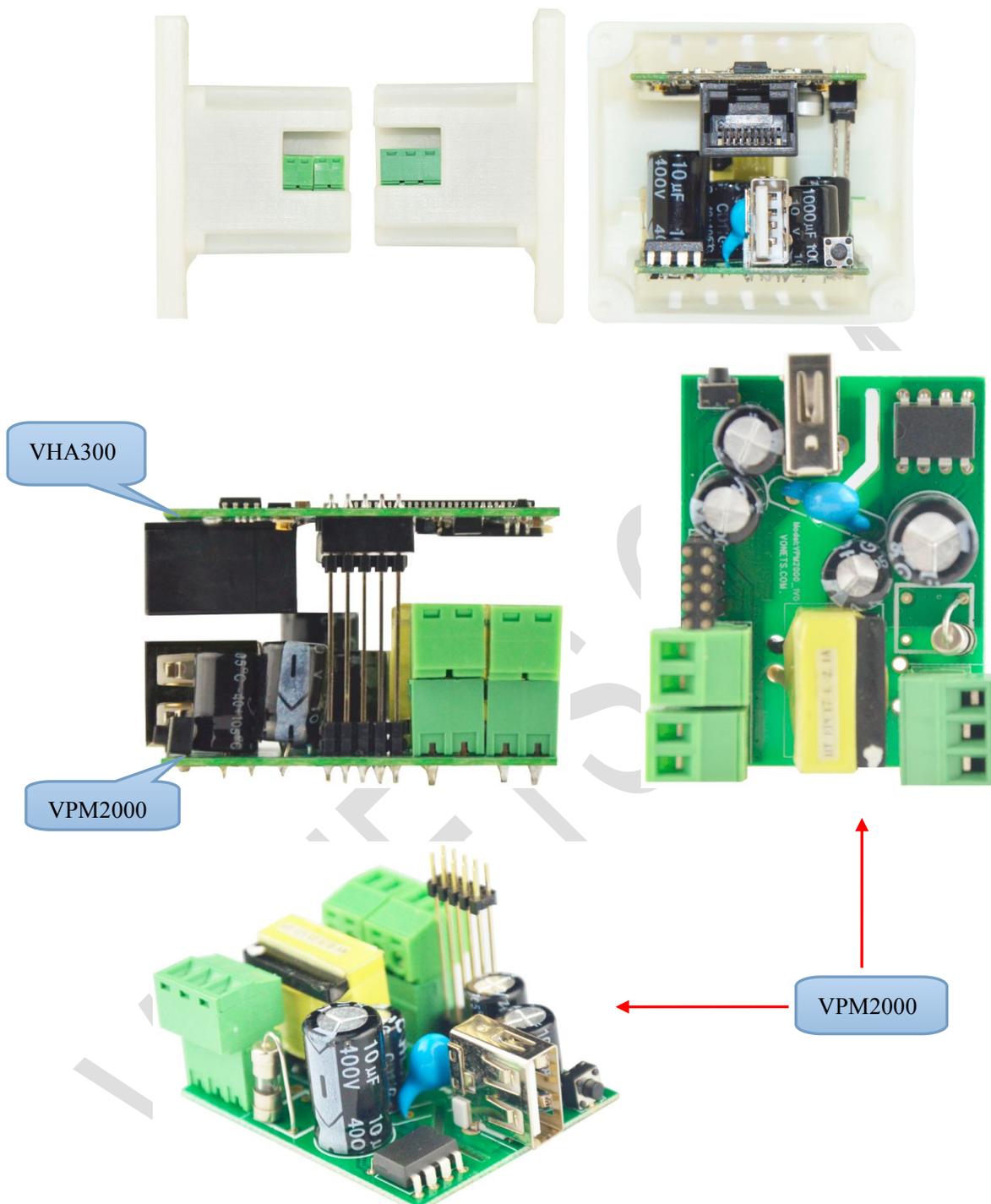
VPM2000

VPM2000

2.6 About paid accessories
● External antenna and VPM2000 are paid accessories

3. VNET-FREE smart home control agreements with its module
   3.1 VNET-FREE is an industry alliance that jointly launched by many
       domestic and foreign smart home companies, the alliance jointly
       developed VNET-FREE smart home protocol, it could also compatible

We belong to China, we also belong to the world.....HouTian VONETS

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with IP networks、 ZigBee network Network、the traditional RS485
industrial control networks;

3.2 VNET-FREE Smart Home protocol includes the following sub-set of
protocols
- VNET-FREE cloud service protocol
- VNET-FREE Subnet Registration protocol
- VNET-FREE Subnet Control Protocol
- VNET-FREE Subnet scenario Service protocol
- VNET-FREE Subnet Remote Data Service protocol

3.3 VHA300 with built-in VNET-FREE subnet control protocol, it can be
implemented for smart control for appliances within the subnet
of course,if you want to achieve cross-subnet cloud operations, it is still
need to increase VNET-FREE subnet Registered client.onVHA300

4. Users free of rights and the development of product customization
4.1 VONETS users can free download open-wrt-2.6.36 for VONETS source
Code development kit from VONETS website, MT7620 original source SDK
development kit,but prohibit the illegal dissemination to third parties and
only VONETS hardware users can use development kits.
4.2 In the case of non-payment, VONETS will not provide users with
developing code-level source code interpretation and service workers
4.3 VONETS provide paid product quickly customize services to users,
use the most efficient speed to provide the user with: shape design,
PCB board design, function definition,software development,
manufacturing and other services.
(WiFi products, ZigBee, wireless transmission of all types of
sensors,smart home products)

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