

# A20

(GSM/GPRS + WiFi +Camera four frequency band)

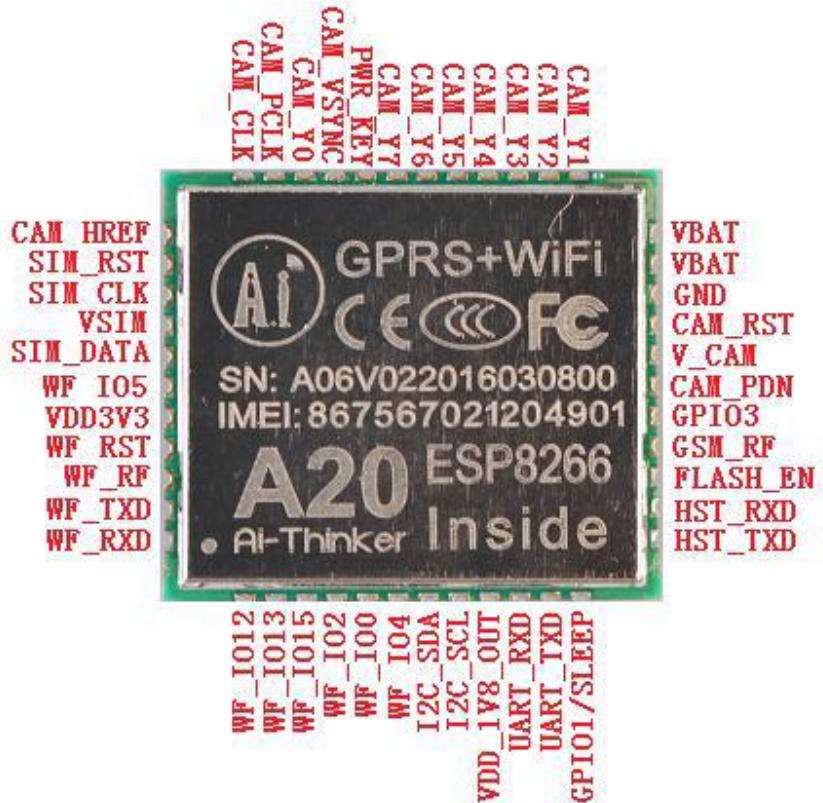
A20 is a wireless module that combine GPRS and WiFi, also it supports camera connection. It uses ESPRESSIF's WiFi IC ESP8285 for the WiFi function.

A20's GPRS module and WiFi module can work separately, be powered separately. This is a good solution for your IoT device to connect internet all the time no matter where it is.

You can choose the following working model to suit your project:

1. Only GPRS. For this model, only provide power for GPRS part, then use MCU to control the GPRS by serial port.
2. Only WiFi. Just like the only GPRS, only provide power for WiFi part, use MCU to control WiFi by serial port.
3. WiFi and GPRS. Use 2 serial port to control WiFi and GPRS separately.
4. WiFi as MCU to control GPRS. Under this model, you can use WiFi IC ESP8285 as MCU to control GPRS. Because there is only one two-way serial port, so user need to program ESP8285.

Pin map



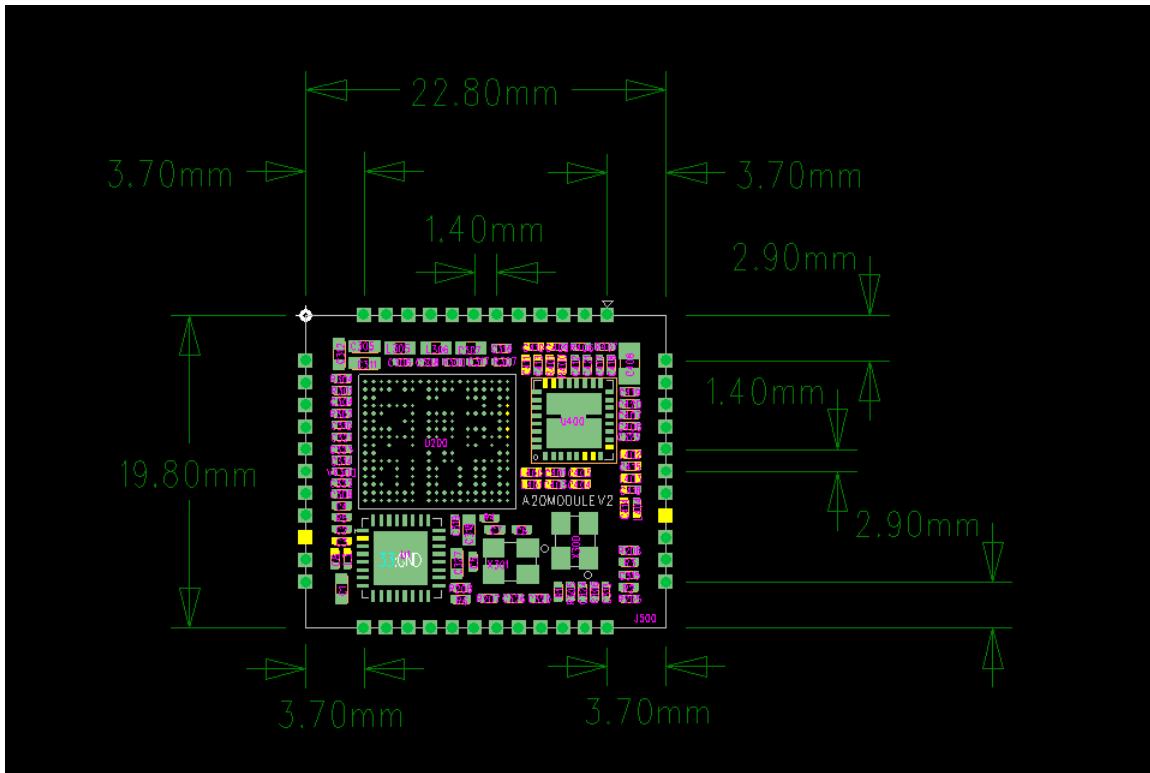
Tips:

1. The camera port only support 0.3M pixel fix-focus camera. Support IC including OV7670, GC0328, GC0309. If you want to use other camera, you can contact us or the manufacturer for software support.
2. In the pin list, the red font pins are all for WiFi, the rest is all for GPRS.
3. GPRS At serial port default speed is 115200

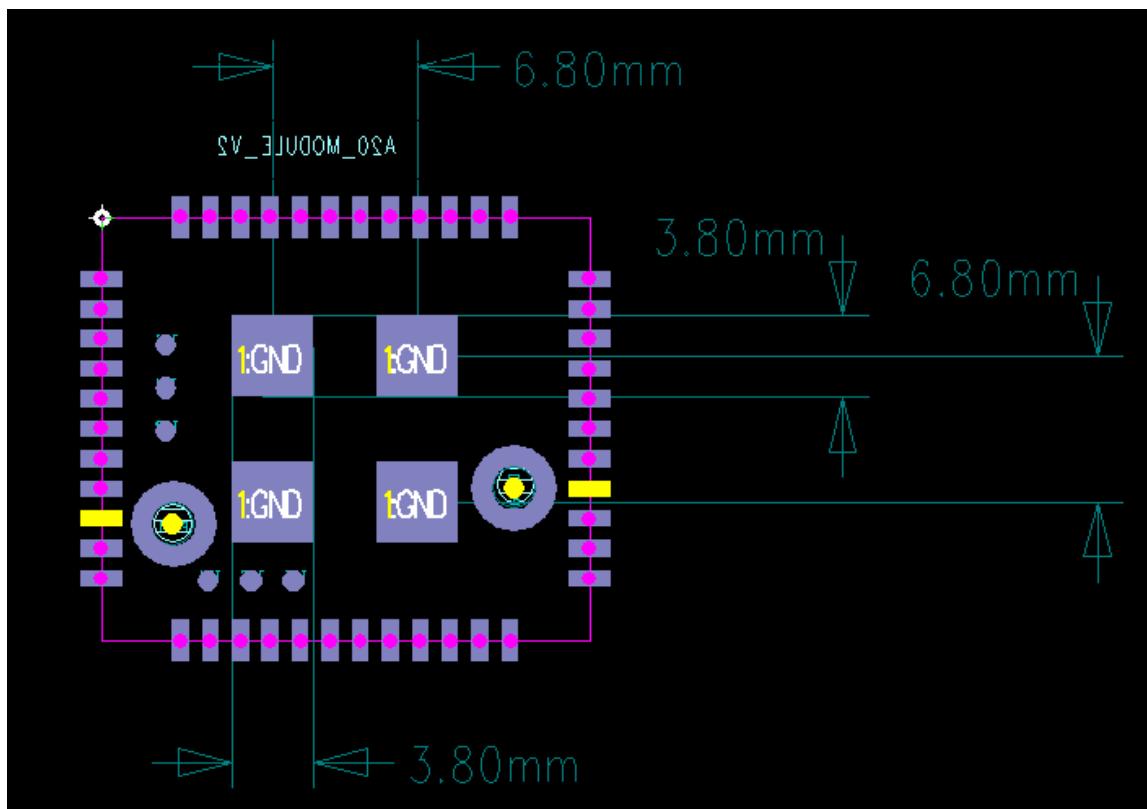
Pin Number	Pin name	Explanation
1	CAM_Y1	Camera data Y1
2	CAM_Y2	Camera data Y2
3	CAM_Y3	Camera data Y3
4	CAM_Y4	Camera data Y4
5	CAM_Y5	Camera data Y5
6	CAM_Y6	Camera data Y6
7	CAM_Y7	Camera data Y7
8	PWR_KEY	Power, keep >1.9V for 2 secs the camera will power on, after that keep it or cut the power, the camera will continue, this pin only requires voltage, no need real power supply.
9	CAM_VSYNC	Camera VSync pin
10	CAM_Y0	Camera data pin Y0

11	CAM_PCLK	Camera PCLK
12	CAM_CLK	Camera clock
13	CAM_HREF	Camera href
14	SIM_RST	Sim card RST
15	SIM_CLK	SIM Card clock pin
16	VSIM	SIM power VCC
17	SIM_DATA	SIM data
18	WF_IO5	ESP8285 GPIO5
19	VDD3V3	ESP8285 3.3V main power
20	WF_RST	ESP8285 reset
21	WF_RF	ESP8285 RF
22	WF_TXD	ESP8285 UART0 TXD
23	WF_RXD	ESP8285 UART0 RXD
24	WF_IO12	ESP8285 GPIO12
25	WF_IO13	ESP8285 GPIO13
26	WF_IO15	ESP8285 GPIO15
27	WF_IO2	ESP8285 GPIO2
28	WF_IO0	ESP8285 GPIO0
29	WF_IO4	ESP8285 GPIO4
30	I2C_SDA	Camera IC I2C DATA
31	I2C_SCL	Camera IC I2C CLOCK
32	VDD_1V8_OUT	OUTPUT 1.8V, can connect to camera IC 1.8V
33	UART_RXD	AT serial port RXD, 2.8V
34	UART_TXD	AT serial port TXD, 2.8V
35	GPIO1/SLEEP	Control sleep model, high level off, low level on. Under sleep model, current<1mA, and serial port is unavailable. Phone call, SMS, GPRS can wake the module from sleep model.
36	HST_TXD	Download serial port TXD, 2.8V
37	HST_RXD	Download serial port RXD, 2.8V
38	FLASH_EN	Flash light control pin, normally need additional amplifier circuit to power the LED light.
39	GSM_RF	GSM RF antenna pin, it requires 50 Ohm impedance when you design PCB
40	GPIO3	Normal GPIO pin, when there is call, SMS, GPRS data in, the module will automatically awake, this pin will output single, from high level to low level, falling edge trigger.
41	CAM_PDN	Camera power down
42	V_CAM	Camera main power
43	CAM_RST	Camera reset
44	GND	GND
45	VBAT	Outside power in 3.5v-4.2v, the power supply's maximum output current must higher than 2A, otherwise the module cannot work stably. This pin also relates to some GPRS/GSM VCC.
46	VBAT	

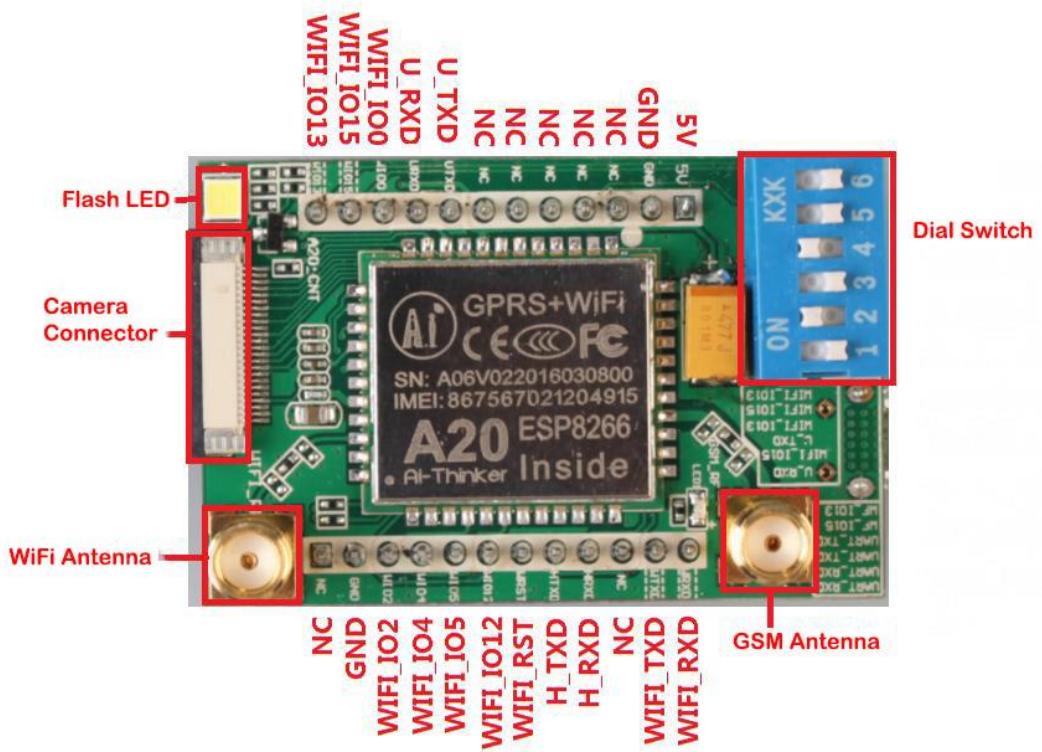
A20 package dimension, total 46 pins



A20 bottom side:



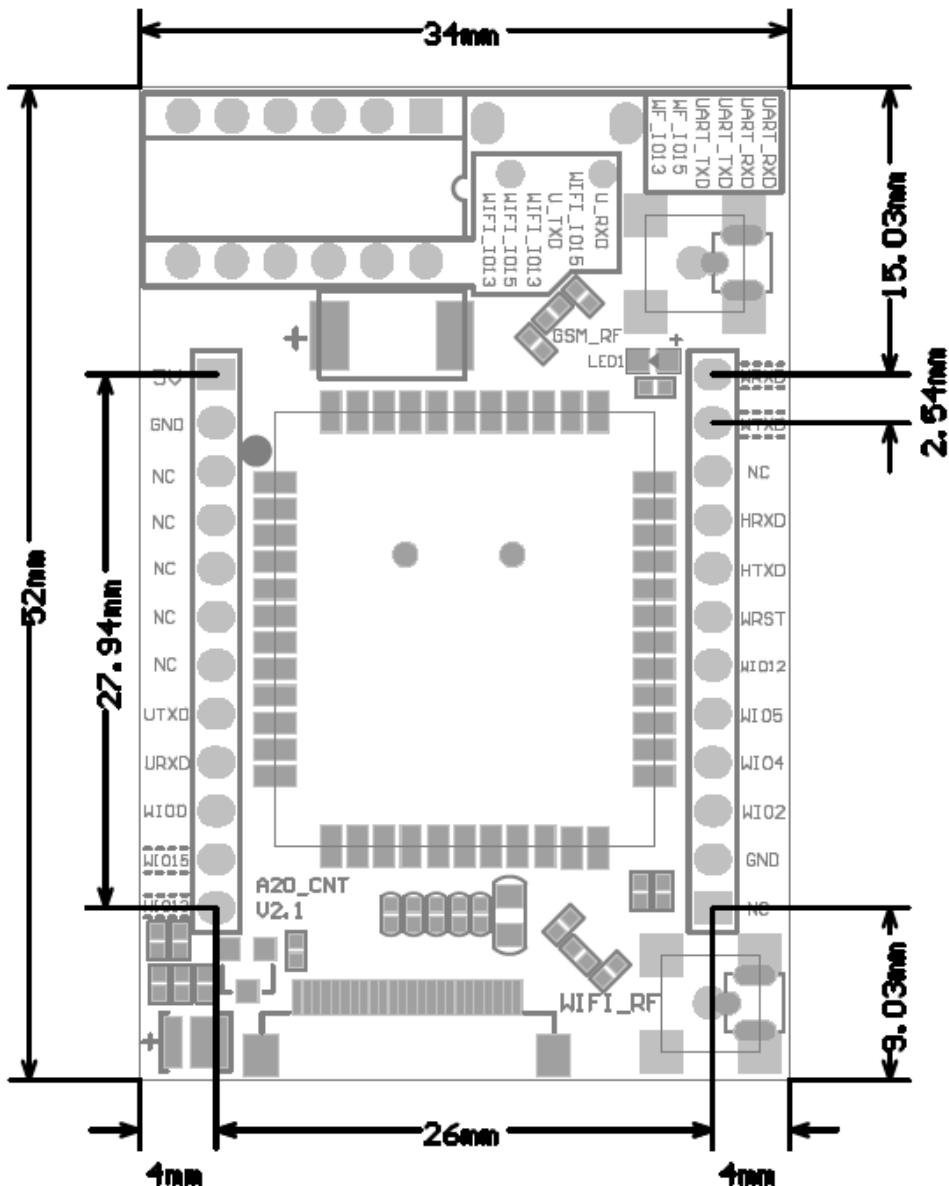
## A20 adapter breakout board pin map and explanation:



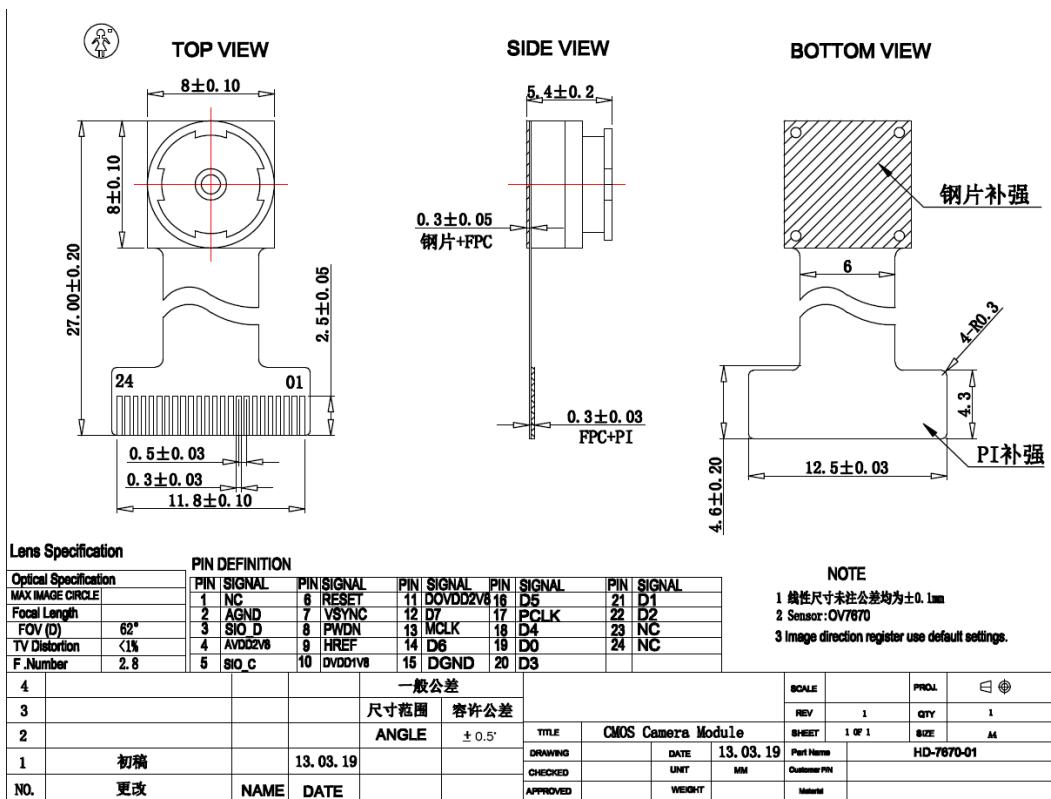
A20 adapter breakout board can use the on-board dial switches to switch the GPRS and WiFi serial port connection.

1. Only GPRS or WiFi. Turn Dial Switch 1 and 3 on, A20's GPRS serial port No.33 and No.34 will connect to breakout male header U\_RXD and U\_TXD. You can use AT command to control GPRS and WiFi.
  2. ESP8285 as MCU to control GPRS. Turn dial Switch 2 and 4 on, ESP8285's IO13 and IO15 will connect to GPRS's AT serial port, so that you can use ESP8285 to operate GPRS.
  3. MCU operates A20. Turn dial switch 5 and 6 on, A20's WiFi IO13 and IO15 will connect to breakout board WiFi\_IO13 and WiFi\_IO15.

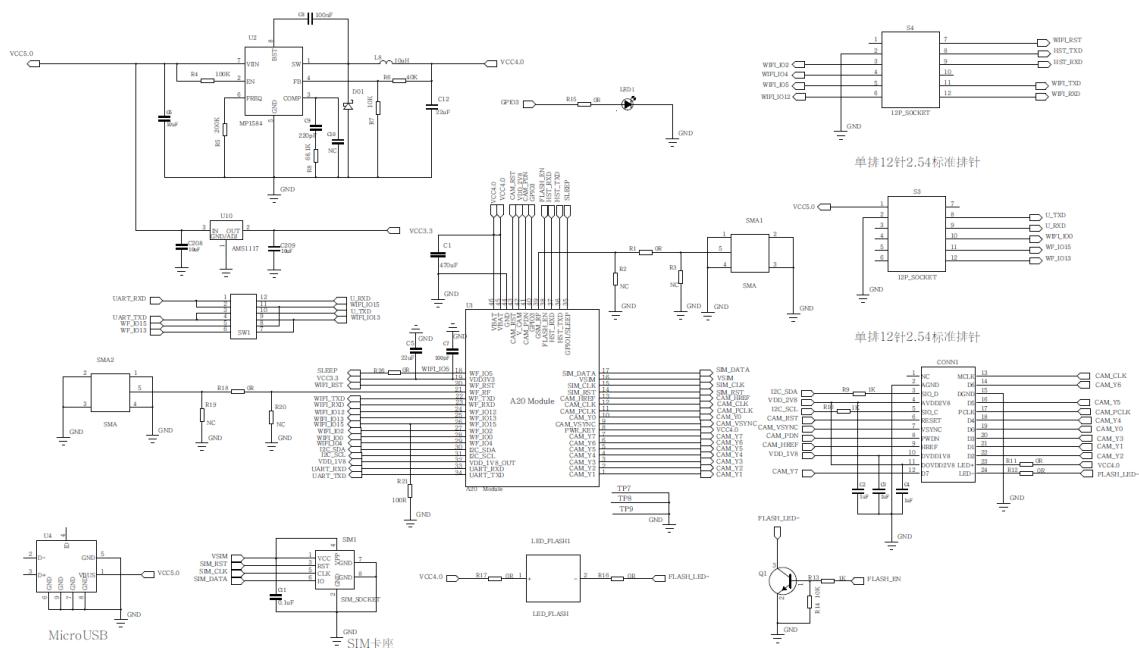
A20 adapter breakout bard package size:



Drawing for the camera with the A20 adapter breakout board:



## A20 adapter breakout board schematic:



## Tips:

1. The power supply's maximum output current must be higher than 2A, otherwise the module cannot work stably. It will cause the module restarting.
2. The antenna's power is high, so it will influence the SIM card. Try to make them far away from each other when you design PCB. Better don't put them on the same PCB side. If you design 4-layer PCB, try to design shield for the serial port circuit.
3. AT serial port's speed is 15200, the AT command must end by \r\n.
4. After starting the module, command "at" is used for testing the module's on/off, "at+ccid" is use for testing the SIM card is in or not, the SIM card can be recognized properly or not. "at+csq" is used for testing internet connection. "at+creg" is used for testing net registration, 1 is local registration, 5 is roaming registration.

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