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# **A6/A7/A6C User Manual**

(GSM/GPRS quad-band+GPS+AGPS)

Ai Thinker Co.Ltd

2016 年 2 月 28 日

## Version Description Document

Version	Time	Author	Description
1	2016-02-26	Eric Zhang	Create
2	2016-06-20	Eric Zhang	Revise,Added description of the A7 and A6V3 hardware description
3	2016-06-28	Eric Zhang	Revise Bug part
4	2016-06-29	Eric Zhang	Increase A6 pin description of hardware and package
5			

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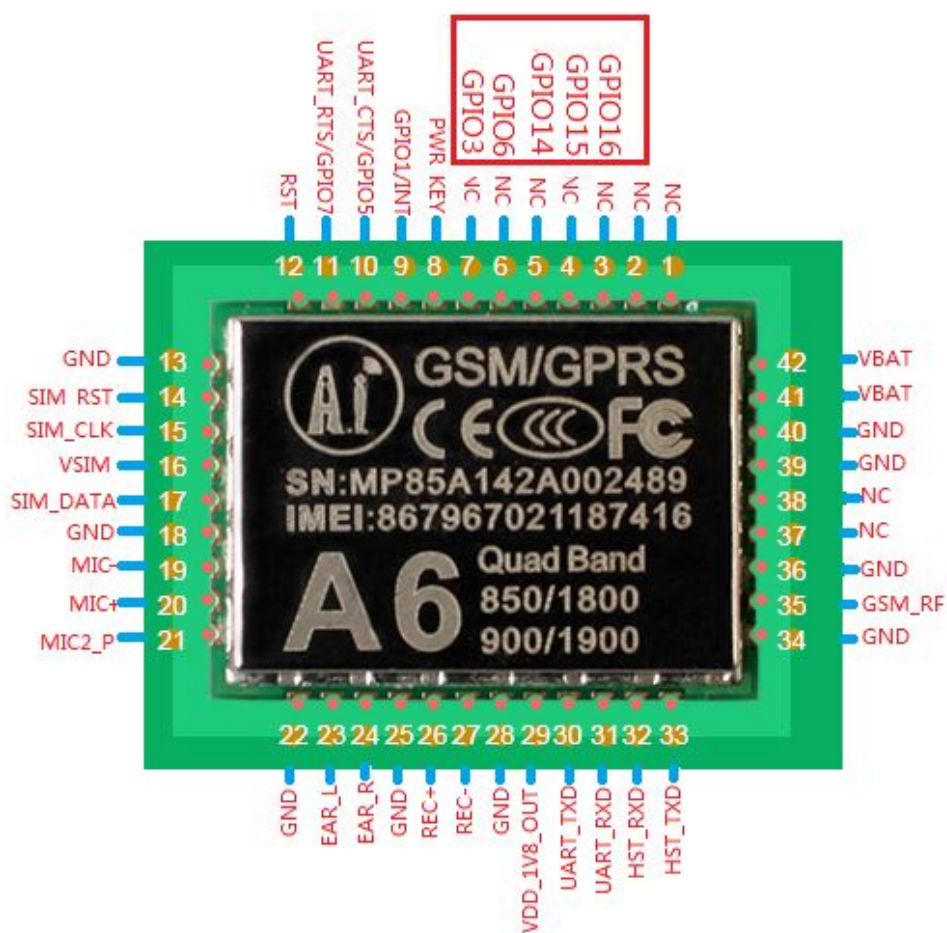
## 1.Features

- Size specifications
  - A6 size : 22.8×16.8×2.5mm;
  - A7 size : 22.8×19.8×2.5mm;
- Working temperature : -30℃to+80℃;
- Working voltage : 3.3V-4.2V;
- Power voltage: >3.4V;
- Standby currents below 3ma, A7 increase 2m;
- Support quad-band GSM/GPRS, include 850,900,1800,1900MHZ;
- GPRS Class 10;
- Sensitivity: <-105;
- Supports voice calls
- Supports SMS messages
- GPIO-level 2.8V;
- Supports GPRS data services, the maximum data rate, download 85.6Kbps, upload 42.8Kbps
- Support standard GSM07.07,07.05 AT commend and Ai Thinker extended commands
- Supports 2 serial ports:download a serial port and AT command port;
- AT commands support the standard AT, and TCP/IP command interface;
- Support for digital audio and analog audio, support HR,FR,EFR,AMR speech coding;
- Support GPS+AGPS (only A7 support) ;
- GPS location information support a separate serial NEMA output and read by AT (only A7 support)
- Support external 300,000 pixel webcam;
- Support ROHS, FCC, CE, CTA certification;
- SMT 42PIN package;



## 2.A6 module (GSM+GPRS, quad-band)

### 2.1. A6 Pin Descriptions

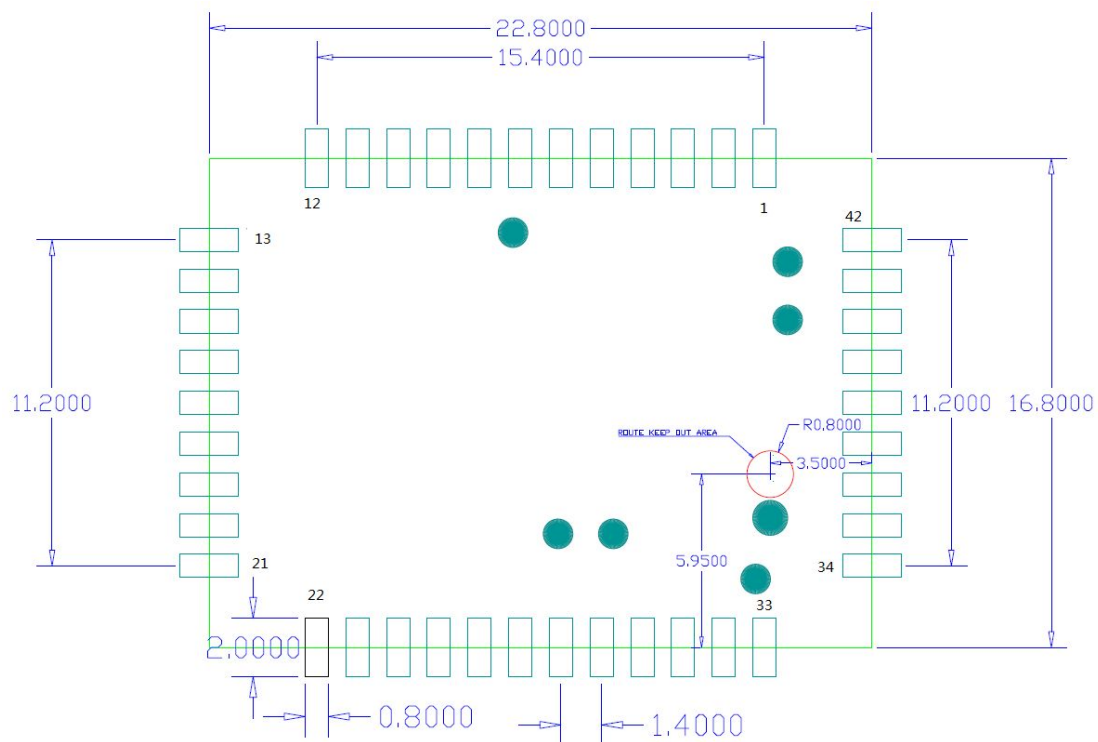


Pin number	Pin name	function
1	NC	NC,
2	NC	NC
3	NC	NC, V3 version of hardware for GPIO16
4	NC	NC, V3 version of hardware for GPIO15
5	NC	NC, V3 version of hardware for GPIO14
6	NC	NC, V3 version of hardware for GPIO6,(As a network status indicator)
7	NC	NC, V3 version of hardware for GPIO3
8	PWR_KEY	Power button, >1.9V more than 2s to boot; After power on ,connecting and disconnecting,Both are ok.
9	GPIO1/INT	Used to control the module to enter low-power mode, high exit low level access, in this mode the standby current <1mA .( in this mode ,the serial port cannot be used,please note)
10	UART_CTS/GPIO5	UART_CTS pin
11	UART_RTS/GPIO7	UART_RTS pin
12	RST	Module hardware RESET pin, this PIN when using low level <0.05V, current is 70ma, recommends using NMOS control; Pull down mean the module hardware shutdown, the pin during normal work when there is leakage, will cause the module is not stable, it is difficult to register network
13	GND	GND
14	SIM_RST	SIM Card RST pin
15	SIM_CLK	SIM card CLK pin
16	VSIM	SIM power pin
17	SIM_DATA	SIM data pin
18	GND	GND
19	MIC-	MIC-
20	MIC+	MIC+
21	MIC2_P	Headphone MIC interface
22	GND	GND
23	EAR_L	Headphones left
24	EAR_R	Headphones right
25	GND	GND
26	REC+	Speaker positive



27	REC-	Speaker negative
28	GND	GND
29	VDD_1V8_OUT	External 1.8V Power pin
30	UART_TXD	UART_TXD,Pin level 2.8V
31	UART_RXD	UART_RXD,Pin level 2.8V
32	HST_RXD	Download serial port RXD Pin, pin level 2.8V
33	HST_TXD	Download serial port TXD pin, pin level 2.8V
34	GND	GND
35	GSM_RF	Antenna pin, can connect Antenna, if connect PCB lin, advice 50ohm cable.
36	GND	GND
37	NC	NC
38	NC	NC
39	GND	GND
40	GND	GND
41	VBAT	External power supply (3.5V-4.2V ), maximum power supply current > 2A
42	VBAT	

## 2.2.Package information



### 3.A7 Module (GSM+GPRS+GPS+AGPS,quad-band)

Instructions for use: increases AT

AT+GPS=1 open GPS  
AT+GPS=0 Shut down GPS  
AT+AGPS=1 open AGPS  
AT+AGPS=0 shut down AGPS

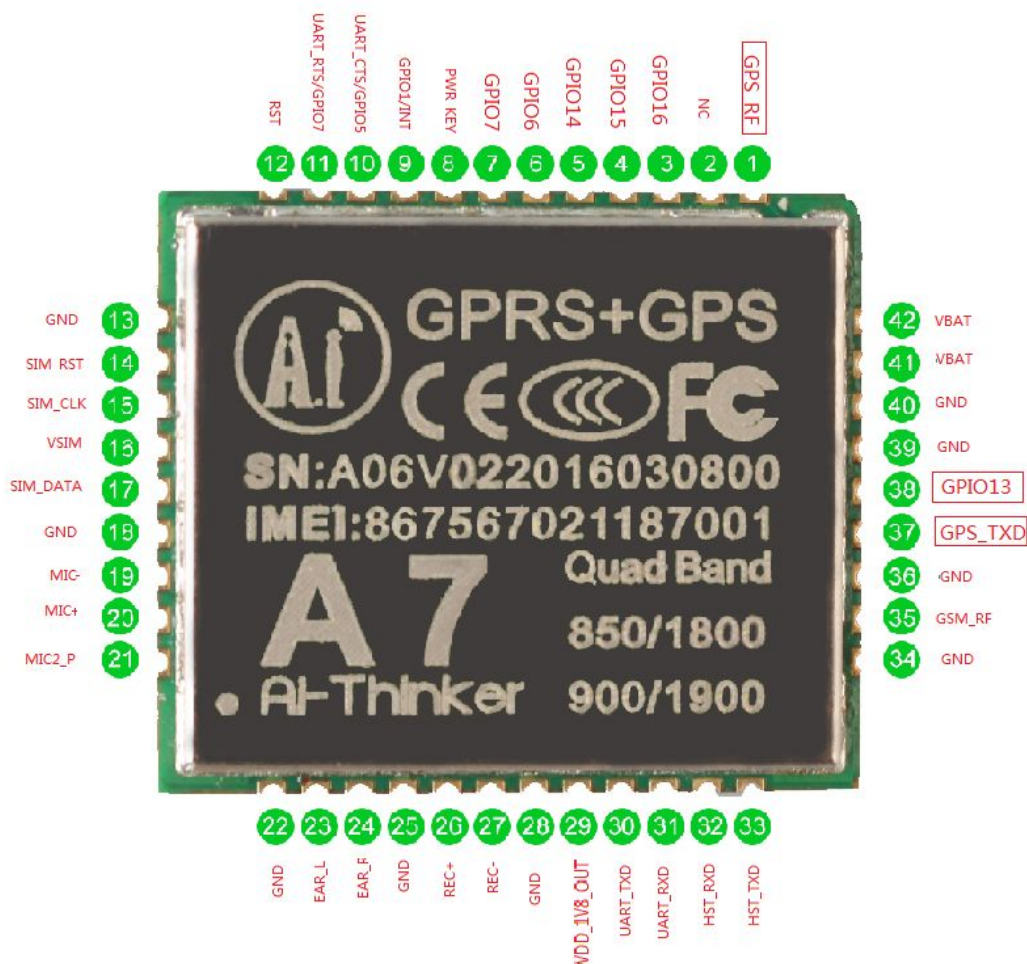
After you open the GPS/AGPS, default information from NEMA GPS\_TXD output pins with a 9600 baud rate, if make NEMA output by AT serial port,can be used AT +GPSRD.

AT+GPSRD=0 Shut down NEMA output by AT serial port

AT+GPSRD=N NEMA information N seconds output ONE time by AT serial port, actual use of n into numbers

Specific reference to follow-up AT the document and use the sample.

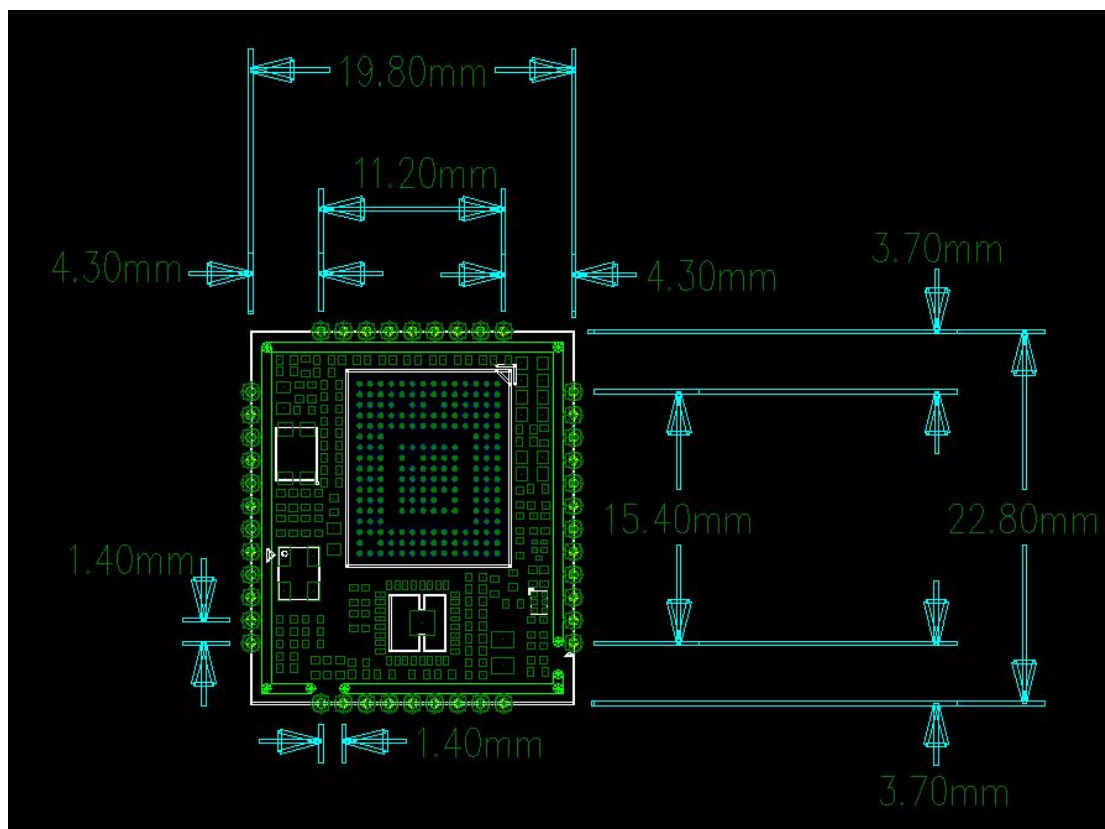
### 3.1 A7 Module Pin Descriptions



Pin Number	Pin Name	Function
1	GPS_RF	GPS Antenna Pin , connect external GPS Antenna; if connect PCB lin,advice 50ohm cable.
2	GND	GND
3	GPIO16	GPIO16
4	GPIO15	GPIO15
5	GPIO14	GPIO14
6	GPIO6	GPIO6
7	GPIO7	GPIO7
8	PWR_KEY	Power button, >1.9V more than 2s to boot; After power on ,connecting and disconnecting,Both are ok;
9	GPIO1/INT	Used to control the module to enter low-power mode, high exit low level access, in this mode the standby current <1mA .( in this mode ,the serial port cannot be used,please note)
10	UART_CTS/GPIO5	UART_CTS Pin
11	UART_RTS/GPIO7	UART_RTS Pin
12	RST	Module hardware RESET pin, this PIN when using low level <0.05V, current is 70ma, recommends using NMOS control; Pull down mean the module hardware shutdown, the pin during normal work when there is leakage, will cause the module is not stable, it is difficult to register network
13	GND	GND
14	SIM_RST	SIM Card RST pin
15	SIM_CLK	SIM card CLK pin
16	VSIM	SIM power pin
17	SIM_DATA	SIM data pin
18	GND	GND
19	MIC-	MIC-
20	MIC+	MIC+
21	MIC2_P	Headphone MIC interface
22	GND	GND
23	EAR_L	Headphones left
24	EAR_R	Headphones right
25	GND	GND

26	REC+	Speaker positive
27	REC-	Speaker negative
28	GND	GND
29	VDD_1V8_OUT	External 1.8V Power pin
30	UART_TXD	UART_TXD,Pin level 2.8V
31	UART_RXD	UART_RXD,Pin level 2.8V
32	HST_RXD	Download serial port RXD Pin, pin level 2.8V
33	HST_TXD	Download serial port TXD Pin, pin level 2.8V
34	GND	GND
35	GSM_RF	Antenna pin, can connect Antenna, if connect PCB line, advice 50ohm cable.
36	GND	GND
37	GPS_TXD	GPS NEMA, Output serial port, output GPS NEMA format information, 1 second a NEMA information;
38	GPIO13	GPIO13
39	GND	GND
40	GND	GND
41	VBAT	External power supply (3.5V-4.2V),
42	VBAT	maximum power supply current > 2A

### 3.2. A7 module Package information



## 4. A6C (GSM+GPRS+CAMERA,quad-band)

**Increase AT:**

**AT+CAMSTART=N**, From 0 to 2,N means working mode, 0 means QVGA,1 mean VGA,2 means QQVGA

**AT+CAMCAP** : take photos, default pictures are JPG format

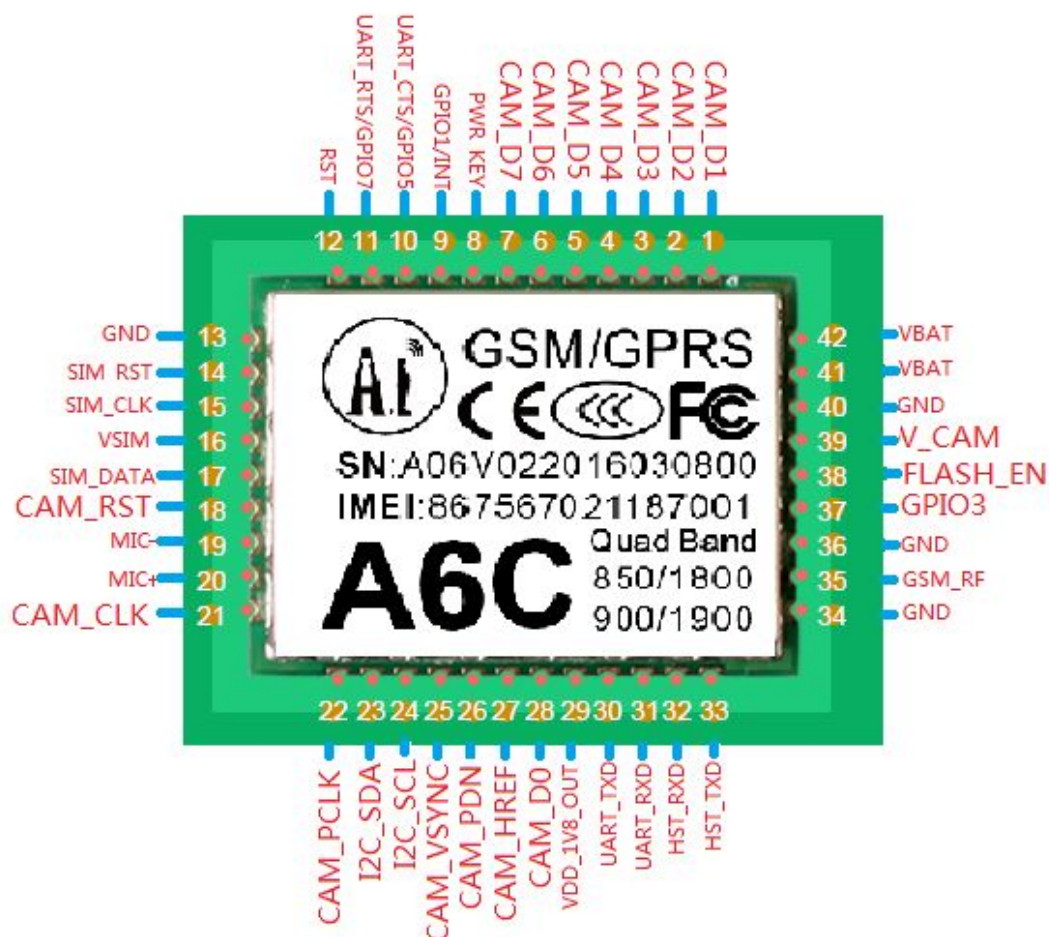
**AT+CAMRD** : Read the photo content, JPG file format

**AT+CAMSTOP** : To close the camera

**Specific reference to follow-up AT the document and use the sample.**



## 4.1 A6C Module Pin Descriptions



**Note: camera interface supports only 300,000 megapixel fixed-focus camera, you can use chips include OV7670,GC0308,GC0328,GC0309, need to contact us if you want to support the new camera chip, and software support.**

Pin Number	Pin Name	Function
1	CAM_D1	Data of the camera foot Y1,
2	CAM_D2	Data of the camera foot Y2
3	CAM_D3	Data of the camera foot Y3
4	CAM_D4	Data of the camera foot Y4
5	CAM_D5	Data of the camera foot Y5
6	CAM_D6	Data of the camera foot Y6
7	CAM_D7	Data of the camera foot Y7
8	PWR_KEY	Power button, >1.9V more than 2s to boot; After power on ,connecting and disconnecting,Both are ok; ;
9	GPIO1/INT	Used to control the module to enter low-power mode, high exit low level access, in this mode the standby current <1mA .( in this mode ,the serial port cannot be used,please note)
10	UART_CTS/GPIO5	UART_CTS Pin
11	UART_RTS/GPIO7	UART_RTS Pin
12	RST	Module hardware RESET pin, this PIN when using low level <0.05V, current is 70ma, recommends using NMOS control; Pull down mean the module hardware shutdown, the pin during normal work when there is leakage, will cause the module is not stable, it is difficult to register network
13	GND	GND
14	SIM_RST	SIM Card RST pin
15	SIM_CLK	SIM card CLK pin
16	VSIM	SIM power pin
17	SIM_DATA	SIM data pin
18	CAM_RST	RESET Pin of camera
19	MIC-	MIC-
20	MIC+	MIC+
21	CAM_CLK	Camera master clock
22	CAM_PCLK	Camera PCLK
23	I2C_SDA	camera of chip I2C data pin
24	I2C_SCL	camera of chip I2C clock pin
25	CAM_VSYNC	camera VSYNC

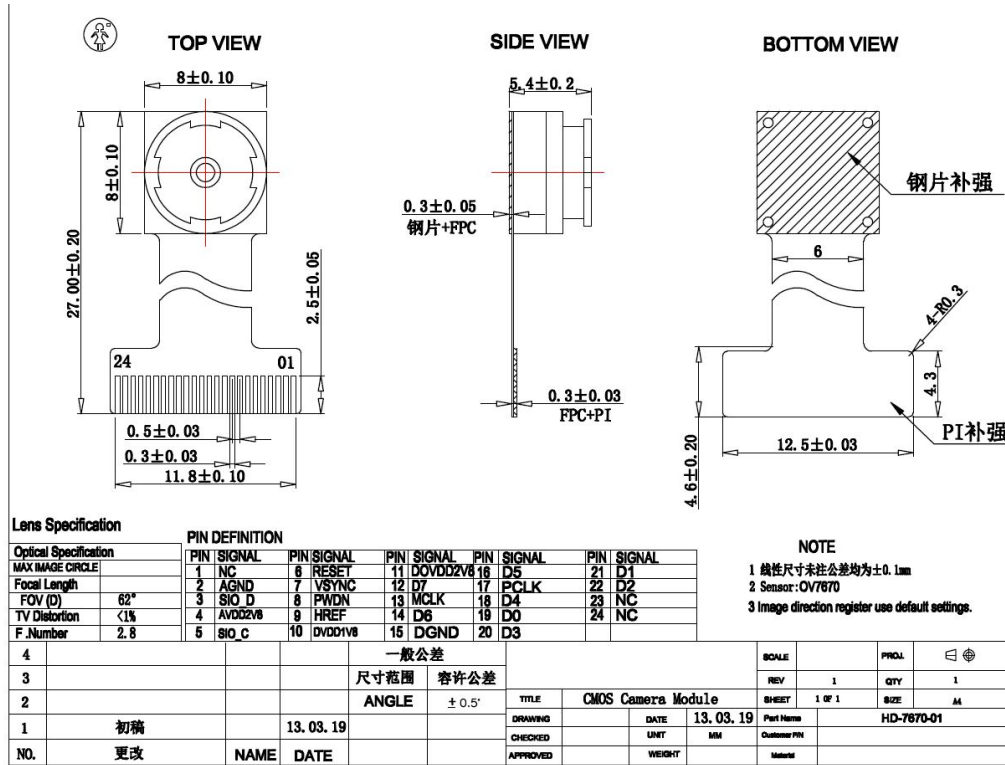
26	CAM_PDN	Power down pin of camera
27	CAM_HREF	Camera HREF
28	CAM_D0	Data pin of camera Y0
29	VDD_1V8_OUT	External 1.8V power feet, the camera chip 1.8V
30	UART_TXD	UART_TXD,Pin level 2.8V
31	UART_RXD	UART_RXD,Pin level 2.8V
32	HST_RXD	Download serial port RXD Pin, pin level 2.8V
33	HST_TXD	Download serial port TXD Pin, pin level 2.8V
34	GND	GND
35	GSM_RF	Antenna pin, can connect Antenna, if connect PCB lin, advice 50ohm cable.
36	GND	GND
37	GPIO3	GPIO
38	FLASH_EN	Flash control Pin, you generally need an external amplifier to power LED lights
39	V_CAM	Camera power supply
40	GND	GND
41	VBAT	External power supply (3.5V-4.2V ), maximum power supply current > 2A
42	VBAT	

## **4.2 A6C The external dimensions**

Refer to the A6 ,same to A6;

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### 4.3 Reference camera interface drawings



Contact :sherry@aithinker.com

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