

ZYM-GA802-3 V3.0 SIRF4 GPS Module



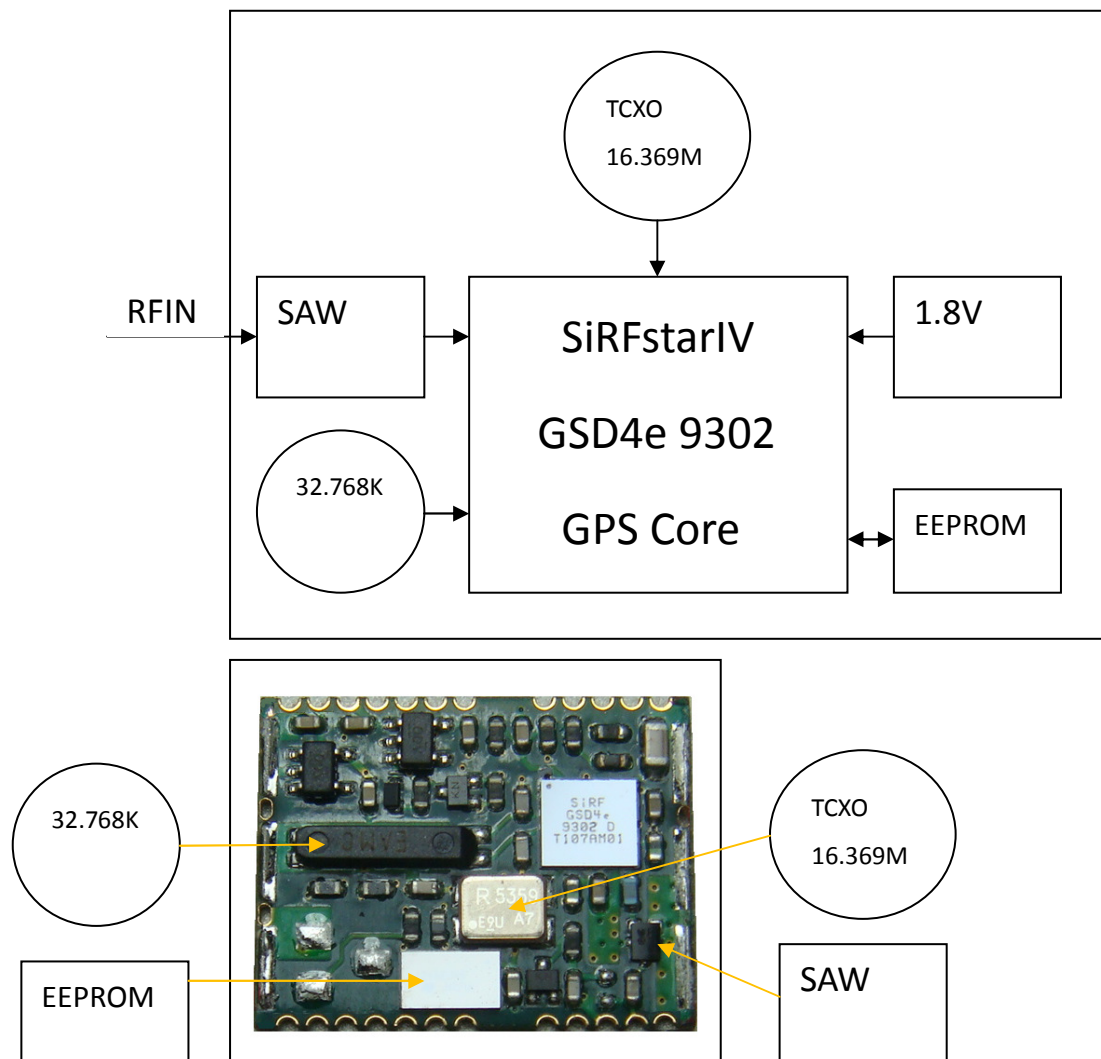
1. Introduction

ZYM-GA802 is a high performance, low power consumption, small size, very easy integrated GPS engine board, based on the SiRFstarIV technology.

Main Features:

- Based on the latest SiRFstarIV
- High sensitivity navigation engine (PVT) tracks as low as -163dBm
- Cold Start 35s average
- 48 track verification channels
- SBAS (WAAS)
- Active Jammer Remover: Removes in-band jammers up to 80 dB-Hz. Tracks up to 8 CW jammers
- GPS data updated through UART
- Small active size: 12.4(W) x 16.4(D) x 2.7(H) mm

Board is illustrated in following figure :



2. ESD handling precautions

The ZYM-GA802-3 modules are Electrostatic Sensitive Devices(ESD).Observe precautions for handling!

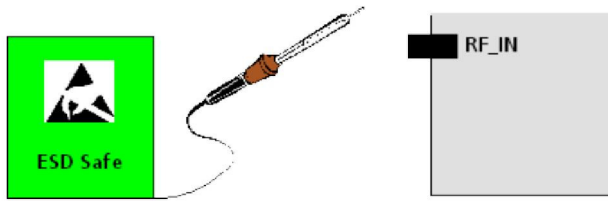
Failure to observe these precautions can result in severe

Damage to the GPS modules.



Unless there is a galvanic coupling between the local GND and the PCB GND,then the first point of contact when handling the PCB shall always be between the local GND and PCB GND.

When soldering RF connectors and patch antennas to the receiver's RF pin, make sure to use an ESD safe soldering iron.



3. Moisture Sensitivity Levels

The Moisture sensitivity levels (MSL) relates to the packaging and handing precautions required.

The ZYM-GA802-3 is sensitive to moisture, rated at MSL level 3.

For MSL standard see IPC/JEDEC J-STD-020. which can be downloaded from www.jedec.org.

4. Technical Futures

4.1. Electrical Characteristics

4.1.1 General

1. Frequency : Tracking L1, C/A code 1575.42MHz.
2. C/A code : 1.023 MHz chip rate.
3. Channels : 48

4.1.2 Accuracy (Open Sky)

1. Horizontal Position Accuracy(Autonomous) : <2.5 meters (50% 24hr Static, -130dBm).
2. Velocity Accuracy: Speed <0.01m/s Heading<0.01°

4.1.3 Datum

- 1.Default : WGS-84.

4.1.4 Time To First Fix (TTFF)

1. Hot start : 1 sec., average.
2. Warm start : 35 sec., average.
3. Cold start : 35 sec., average.

4.1.5 Sensitivity (Autonomous)

1. Acquisition: -148dBm
2. Tracking: -163dBm
3. Navigation: -160dBm

4.1.6 Dynamic Conditions

1. Altitude : <18,288 meters Max
2. Velocity : 515 m/s (<1,000 knots) Max
3. Acceleration : 4G, Max

4.1.7 Power

1. Power input : 3.3V DC for main power and RTC power
2. Input current: Less than 60mA (without antenna)
3. RTC current: Less than 700uA

4.1.8 Serial Port

1. One full duplex serial communication, TTL interface, **4800** baud rate default ,with user selectable baud rate (9600, 19200, 38400, 57600, 115200)-User customized
2. NMEA 0183 Version 3.01 ASCII output

4.2. Environmental Characteristics

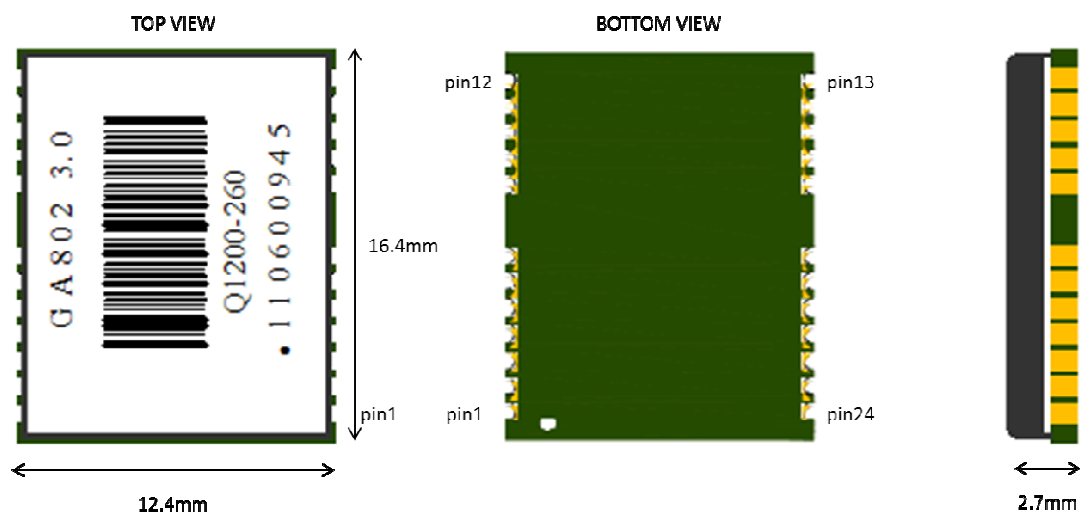
1. Operating temperature range -40 °C to +85 °C
2. Storage temperature range -45 °C to +85 °C

4.3. Physical Characteristics

1. Active Size: 12.4(W) x 16.4(D) x 2.7(H) (mm)
2. Weight: less than 2g

5. Mechanical Dimensions and Electrical feature

5.1. Board outline: (mm)(Tolerance: ± 0.2 mm)



5.2.Pin Description :

Table 5-1 is pin list of the 24-Pin Interface.

Table 5-1

PIN	Name	Type	Description	Electrical Characteristics
1	NC			
2	NC			
3	Timepulse	O	Time pulse output	TTL ; Voh≥2.4V ; Vol≤0.4V ; Iol=2mA
4	NC			
5	NC			
6	NC			
7	NC			
8	NC			
9	VCC_RF	P	VCC voltage output	3.0~3.6V
10	GND	P	System ground	
11	RF_IN		Antenna signal input	ESD Sensitive!
12	GND	P	System ground	
13	GND	P	System ground	
14	NC			
15	NC			
16	NC			
17	NC			
18	NC			
19	NC			
20	TxD1	O	Navigation data output or user define	TTL ; Voh≥2.4V ; Vol≤0.4V ; Iol=2mA
21	RxD1	I	Serial data input or user define	TTL ; Voh≥2.4V ; Vol≤0.4V ; Iol=2mA
22	V_BCKP	P	RTC&SRAM power supply	DC : 2.0V~5.0V Power for RTC
23	VCC	P	System power	DC : 3.0V~3.6V
24	GND	P	System ground	

5.2.1 Timepulse

1 · Timepulse : Time pulse output. This pin provides the 1pps output desired for certain applications. This is a CMOS level output.

5.2.2 UART

One duplicate UART · TTL level.

1 · RxD1: Input, mainly used for GPS control bit.

2 · TxD1: Output, GPS data output.

5.2.3 DC input Characters

1 · VCC: This is the main power supply. This pin contains an integrated +1.8V output LDO. The recommended operation condition is shown in the following table (Table 5-2).

2 · V_BCKP: Power for RTC and SRAM. This pin contains an integrated +1.8V output LDO. The recommended operation condition is shown in the following table (Table 5-2).

Table 5-2

Parameter	Symbol	Min.	Typ.	Max.	Units
Main power supply voltage	VCC	3	3.3	3.6	V
RTC supply and battery backed SRAM supply	VBAT	2	3.3	5	V

3 · VCC_RF: Output pin, VCC output.

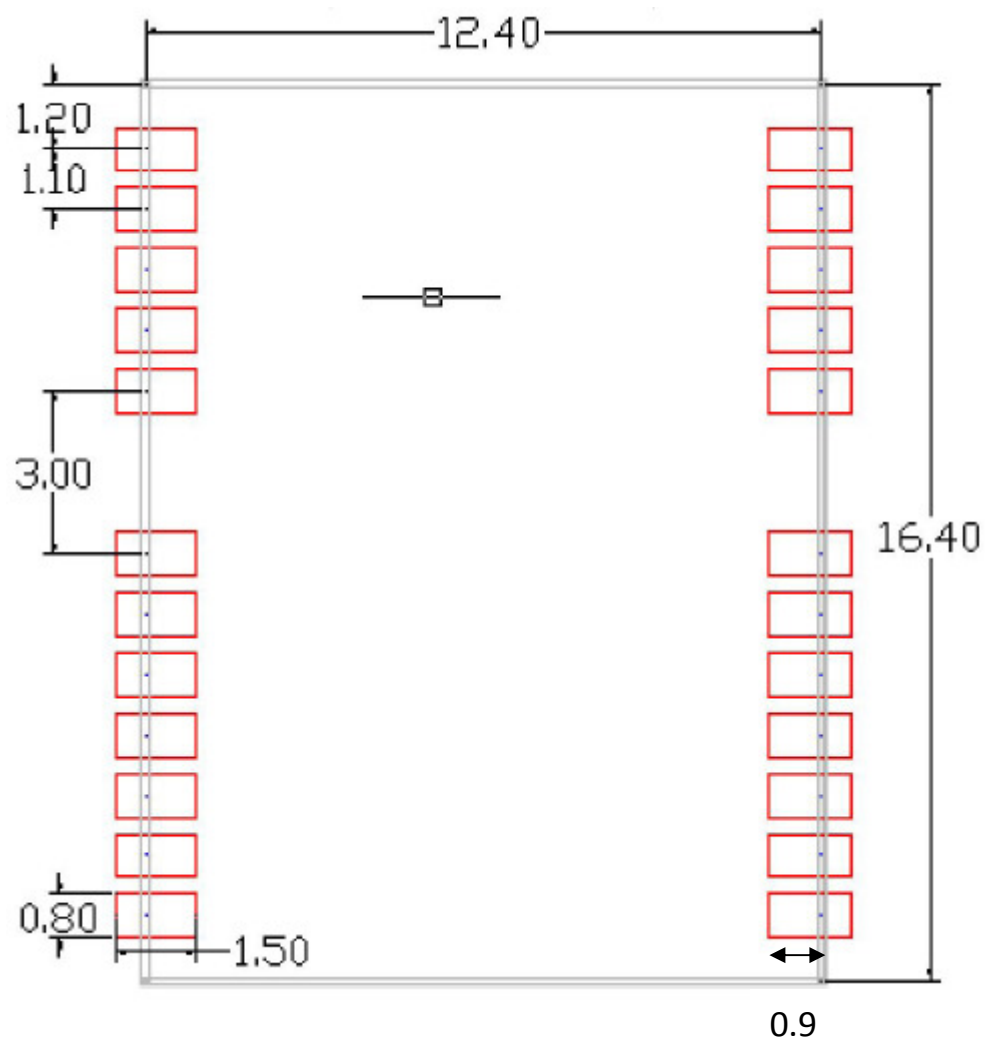
4 · Active antenna power supply instructions:

There is no DC bias power output via RF_IN pin. Active antenna should be powered by external power.

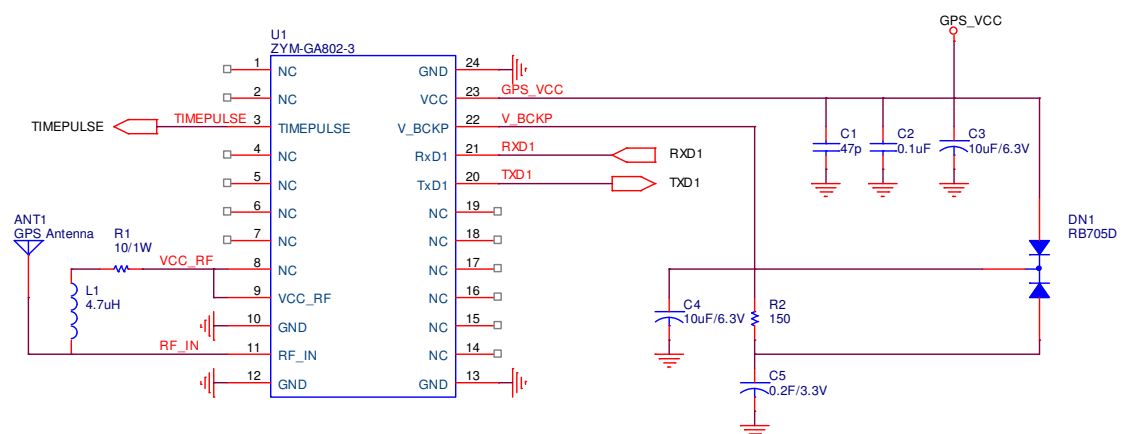
5. RF_IN: GPS signal input pin, active antenna is recommended.

5.3. Recommend PCB Layout:

5.3.1 Recommend pin layout (mm)

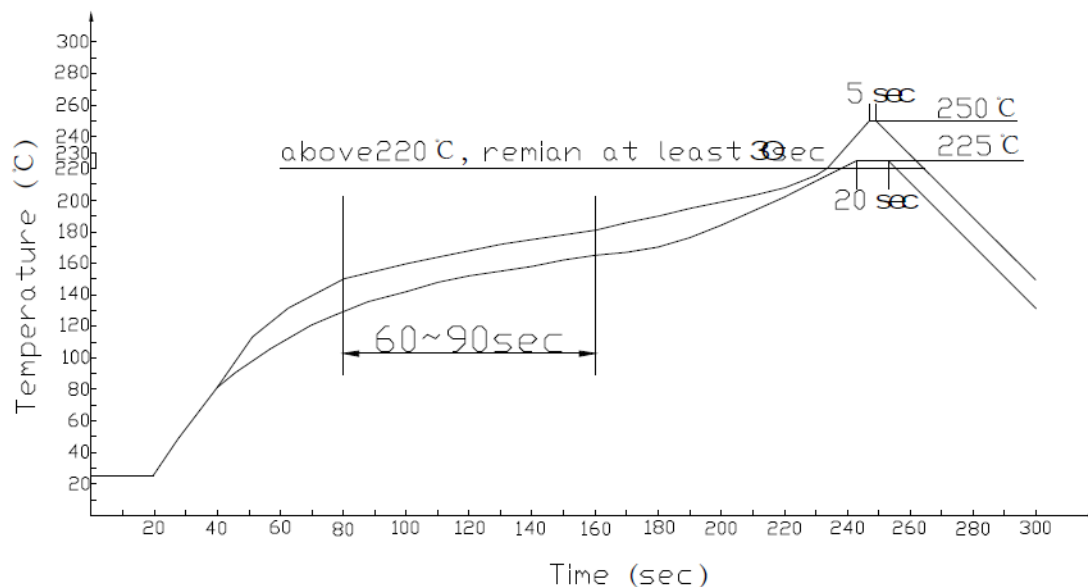


6 · Reference Design



7 · Reflow Profile

Recommended soldering reflow profile for ZYM-GA802-3 mounting on PCB:



! NOTICE:

The equilibrium time can be adjusted to ensure the out gassing of the flux is optimized. The equilibrium time can be increased if there is excessive voiding at PCB level.

Consider for a long time in the soldering zone (with temperature higher than 180°C)

has to be kept as short as possible to prevent component and substrate damages. Peak temperature must not exceed 250°C.

! Important features of profile:

Rise Speed=1~4°C/sec, 25°C to 150°C equilibrium

Preheating Temperature=140°C to 150°C, 60sec~90sec

The ripple Temperature=225°C to 250°C, about 30sec

Lower Speed=2~10°C/sec, to 183°C, about 15sec

Total Time =about 300sec

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