

# SAH1919P-S

# SAH1919P-D

Enhanced Atheros GPS Module with  
slim antenna

**Smart Design Technology Co., Ltd.**

20F-8, No.107, Sec 1, Jhongshan Rd. Sinjhuang City,  
Taipei County 242, Taiwan

Phone: +886-2-8522-7628

Fax: +886-2-8522-7784

Contact: [sales@smartdesign.com.tw](mailto:sales@smartdesign.com.tw)

## Documentation History

<b>Revision</b>	<b>Description</b>	<b>Date</b>	<b>Remark</b>
V0.1	SAH1919P release	Nov 2008	
V1.0	Update dimension	Jun 2009	

# Content

<u>Features.....</u>	<u>4</u>
<u>Block diagram.....</u>	<u>4</u>
<u>Technical Specifications.....</u>	<u>5</u>
<u>Pin Definition.....</u>	<u>7</u>
<u>Output NMEA Messages.....</u>	<u>7</u>
<u>Application Circuit.....</u>	<u>8</u>
<u>Reflow Profile.....</u>	<u>10</u>

**Smart Design Technology Co., Ltd.**

20F-8, No.107, Sec 1, Jhongshan Rd. Sinjhuang City, Taipei County 242, Taiwan  
Phone: +886-2-8522-7628 Fax: +886-2-8522-7784 Contact: [sales@smartdesign.com.tw](mailto:sales@smartdesign.com.tw)

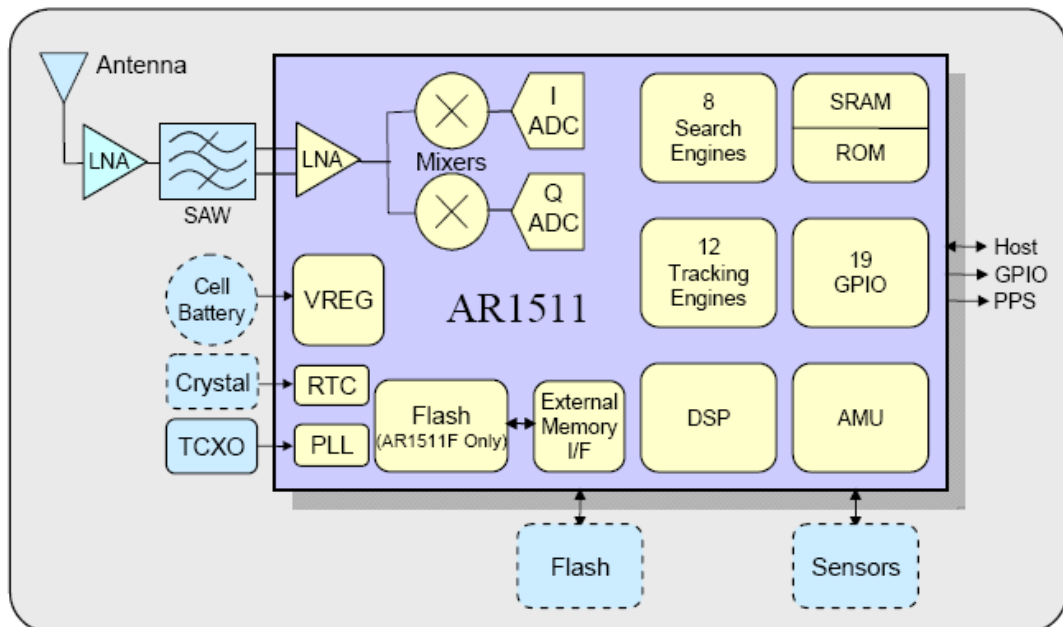
# SAH1919P-S

# SAH1919P-D

## Features

- ✓ 44 channel Atheros AR1511 positioning engine
- ✓ Ultra high sensitivity to -160 dBm
- ✓ Supports AGPS, WAAS, EGNOS and MSAS
- ✓ Support USART ports
- ✓ Support 5 Hz position update rate capability @ 3D fix
- ✓ Low power consumption 65mA
- ✓ 14  $\mu$ A backup current @ 3V
- ✓ Low position/velocity drift in static mode
- ✓ Small form factor 19 x 19 mm with SMT pads or DIP pin.
- ✓ RoHS compliant (lead-free)

## Block diagram



SAH1919P GPS module

## Technical Specifications

### 1. Electrical

#### Characteristics

1.1 Chipset	AR1511	Atheros GPS chip
1.2 General	Frequency	L1, 1575.42MHz
	Channels, C/A code	44, 1.023 MHz chip rate, 8192 time/frequency search windows
1.3 Accuracy	Position	2.5 meters CEP
	Time	1 usecond rms (1 PPS)
1.5 Acquisition Rate	Cold start	35 sec, typical
	Warm start	33 sec, typical
	Hot start	1.3 sec, typical
1.6 Sensitivity	Tracking	-160dBm
	Navigation	-157dBm
	Cold start	-144dBm
1.7 Dynamic Condition	Altitude	18,000 meters (60,000 Feet) max.
	Velocity	400 Km/hr (1000 Knots) max.
1.8 Power	Main Power	3.3 VDC typical
	Supply current	65 mA
	Backup power	1.5 ~ 3.6V
	Backup current	14µA @ 3V
1.9 Serial Port	Electrical interface	USART,
	Protocols	NMEA, 3GPP,
		5 Hz position update rate capability @3D fix

### 2. Environmental Characteristics

2.1 Temperature	Operating range	- 40 °C to + 85 °C
2.2 Mechanical dimensions	L x W x H	19 x 19 x 5 mm
2.3 Interface	I/O connector	10 pin SMD micro package (SAH1919P-S) 10 pin patch 1.27mm (SAH1919P-D)

#### Smart Design Technology Co., Ltd.

20F-8, No.107, Sec 1, Jhongshan Rd. Sinjhuang City, Taipei County 242, Taiwan  
Phone: +886-2-8522-7628 Fax: +886-2-8522-7784 Contact: [sales@smartdesign.com.tw](mailto:sales@smartdesign.com.tw)



## Pin Definition

Pin#	Name	Type	Description
1	GPIO3	I/O	GPIO3
2	NC	NC	Not Connected, keep floating
3	TXD	Output	UART TXD output
4	RXD	Input	UART RXD input
5	Boot	Input	High Boot from Flash, Low Boot from serial port
6	NReset	Input	Baseband RESET input. '0' = reset and '1' = normal operation
7	Vbat	PWR	Linear regulator battery input voltage: 2 - 3.6V.
8	GND	PWR	Ground
9	Vcc	PWR	Input power. Range 3 – 5 V
10	1PPS	Output	Time plus

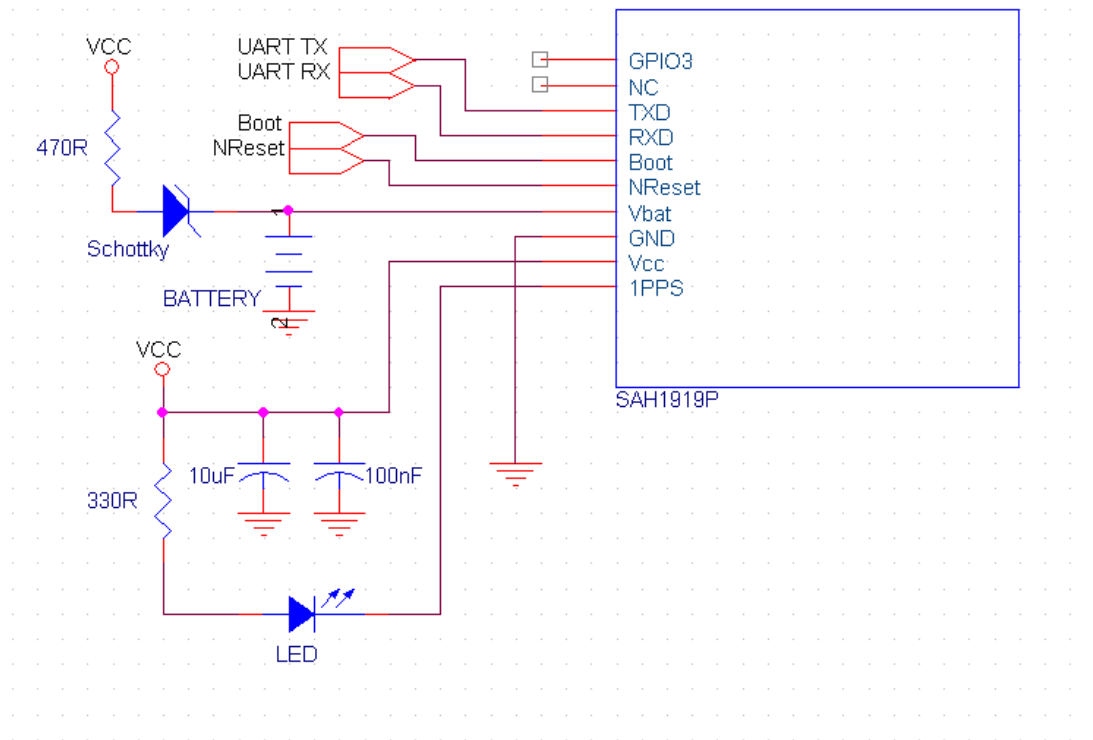
## Output NMEA Messages

Table 3 NMEA-0183 Output Messages

NMEA Sentence	Description
GGA (default)	Global Positioning System Fixed Data
GLL	Geographic Position - Latitude/Longitude
GSA (default)	GNSS DOP and Active Satellites
GSV (default)	GNSS Satellites in View
RMC (default)	Recommended Minimum Specific GNSS data
VTG	Course Over Ground and Ground Speed
ZDA	Time and Date

The detail information please refers to SAHXXX series GPS module NMEA protocol reference manual.

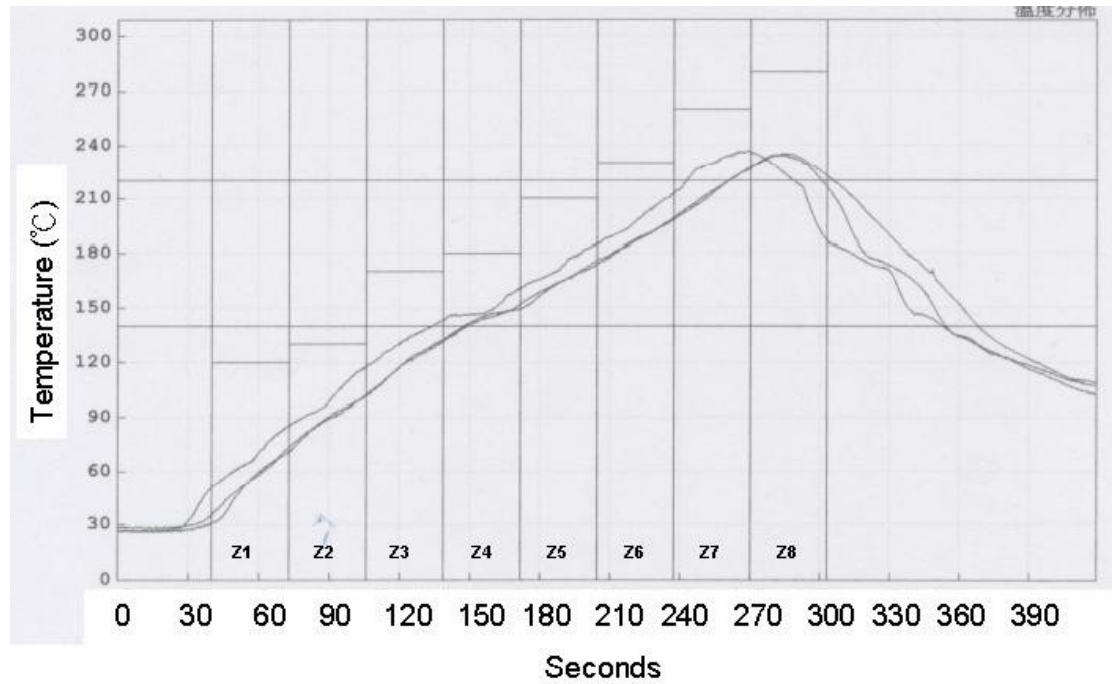
## Application Circuit



## Application note:

1. Please keep this module away from MCU, Inverter or Display. If possible, cover the shielding on inverter and Display.
2. Please supply separate VCC to gps module.
3. Please keep clear trace line beneath the module.

## Reflow Profile



### Setpoints (°C)

Zone	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8
Top	120	130	170	180	210	230	260	280
Bottom	120	130	170	180	210	230	260	280

Conveyer Speed (cm/min): 73