



AK967





**Dalang Communication
Technology Co., Ltd
Product Specification**

Product Name:	Circuit Board
Product Model:	AK967
Version Number:	V 1.0
Revision Date:	2024.06.03

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Shenzhen Dalang Communication Technology Co., Ltd

1 Product Application Scenarios

Our company's AK967-UBX-M9140-KB module is fully compatible with GPS, Beidou Glonass、 The Galileo Four Satellite System, with advanced algorithms, can achieve precise positioning at the meter level in complex environments. The high update rate of 25Hz enables real-time and accurate location information in dynamic scenarios such as drones and autonomous driving. Its integrated SAW filter and anti-interference circuit effectively resist radio frequency interference, and the built-in deception detection algorithm ensures data security. Industrial grade design enables it to operate stably at harsh temperatures ranging from -40 °C to+85 °C. Rich interfaces such as UART, USB, SPI, etc. facilitate device integration and are compatible with M9 series, making it easy to expand functionality. It plays a key role in fields such as the Internet of Things, precision agriculture, and industrial monitoring, as shown in Figure 1.



Figure 1 Product Application Scenarios

2 Features

In this chapter, we will delve into and comprehensively elaborate on the functionalities and operating principles of the AK967, detailing how it plays a pivotal role in various applications as follows:

1. Concurrent reception of multiple constellations: supports GPS Glonass、 The four major satellite navigation systems, Beidou and Galileo, simultaneously receive signals, significantly improving positioning accuracy and usability in complex environments, especially in areas with severe obstruction such as urban high-rise buildings and mountainous areas.

2. Anti interference and anti deception capability: Integrated SAW filter and low noise amplifier (LNA), effectively suppressing RF interference; Built in deception detection algorithm can quickly identify and report malicious signal attacks, ensuring the authenticity and security of positioning data.

3. High update rate and low latency: Provides a maximum position update frequency of 25Hz, suitable for dynamic scenarios such as drones and autonomous driving, ensuring real-time requirements and reducing the impact of latency on system control.

4. Meter level positioning accuracy: Through advanced signal processing algorithms and multipath suppression technology, the horizontal positioning accuracy can reach 1.5 meters (CEP), meeting the high precision requirements of applications such as smart cities and precision agriculture.

5. The working temperature range is -40°C to $+85^{\circ}\text{C}$, supporting stable operation in high temperature, low temperature, and strong electromagnetic interference environments, meeting the needs of industrial, outdoor, and other professional fields.

3 Structural Characteristic

In this section, we will thoroughly present and analyze the design details of the product, depicting its exterior features through comprehensive imagery. This view offers a holistic perspective, facilitating an understanding of the product's architecture. Refer to Figure 2, Table 1, Table 2 .

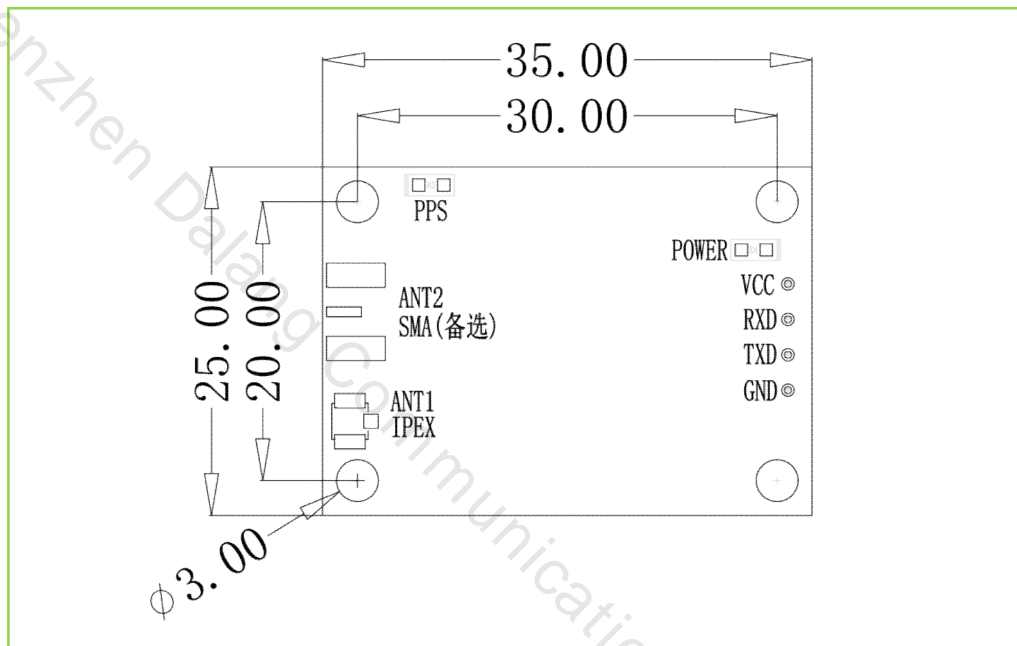


Figure 2 Product structure diagram

Table 1 PIN pin functions

Pin Number	Signal Name	Signal Description
1	VCC	Main Power Input 3.0-5.5V for COM1
2	RXD	Receive Data Pin used to receive data sent from other devices
3	TXD	Transmit Data Pin used to send data to other devices
4	GND	Ground Pin used as a common electrical reference point
LED Indicators	1	POWER - Indicates power supply status
	2	PPS - Pulse Per Second (PPS) output, flashes when positioned to indicate second pulse output

Table 2 Interface Characteristics

NO.	Name	Symbol	Minimum value	Typical values	Maximum value	Unit
1	Main power supply	Vcc	2.7	3.3	5.0	V
3	RF port feeding	VRF	3.0	3.1	3.3	V
4	Input high level	VIH	2.0			V
5	Input low level	VIL			0.7	V
6	Output high level	VOH	3.2			V
7	Input low level	VOL			0.1	V
8	Main serial port baud rate	Baud		38400		bps

4 Specifications

In this section, we will provide a detailed list and explanation of the product's chip features, sensitivity, accuracy, operating principles, and other technical details, as detailed in Table 2.

Table 2 Product Specifications

Chip characteristics	chip	UBLOX-M9140-KB
	working frequency	GPS L1 C/A, QZSS L1 C/A/S, GLONASS L1OF, BeiDou B1I, Galileo E1B/C, SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN
Sensitivity	Receiving channel	92 channels,
	track	-167 dBm
	Re capture	-160 dBm
	cold boot	-148 dBm
First positioning time TTFF	Hot start	-159 dBm
	cold boot	24s
	Hot start	2s
Accuracy	Re capture	2s
	Horizontal Accuracy	1.5m CEP (with SBAS) 2.0m CEP (without SBAS)
	time pulse	RMS :30ns 99% : 60ns
	Speed accuracy	0.5m/s
Operation restrictions	Gravity acceleration limit	≤ 4 g
	height restrictions	80,000 m
	speed limit	500 m/s
Output data	Baud rate	38400bps (default)
	Output Protocol	NMEA0183
	update frequency	0.25Hz-25Hz (default 1Hz)

	Carrier phase output	Support, output RAWX statement
	FLASH	built-in
Electrical specifications	working voltage	3.3V-5V DC
	power waste	<100mW
Physical parameters	size	35*25*4mm
	weight	3.8g
	Connector	2.54mm pin socket * 4
	Antenna connector	IPEX
Environment	working temperature	-40°C-85°C
	Storage temperature	-40°C-85°C

5 Product Photos

In this chapter, we will showcase real-life images of the product, as shown in Figure 3. These images provide a detailed view of our product from various angles and perspectives. We believe that through authentic representation, we can better convey the value and concept of the product, thereby enhancing your trust and satisfaction.

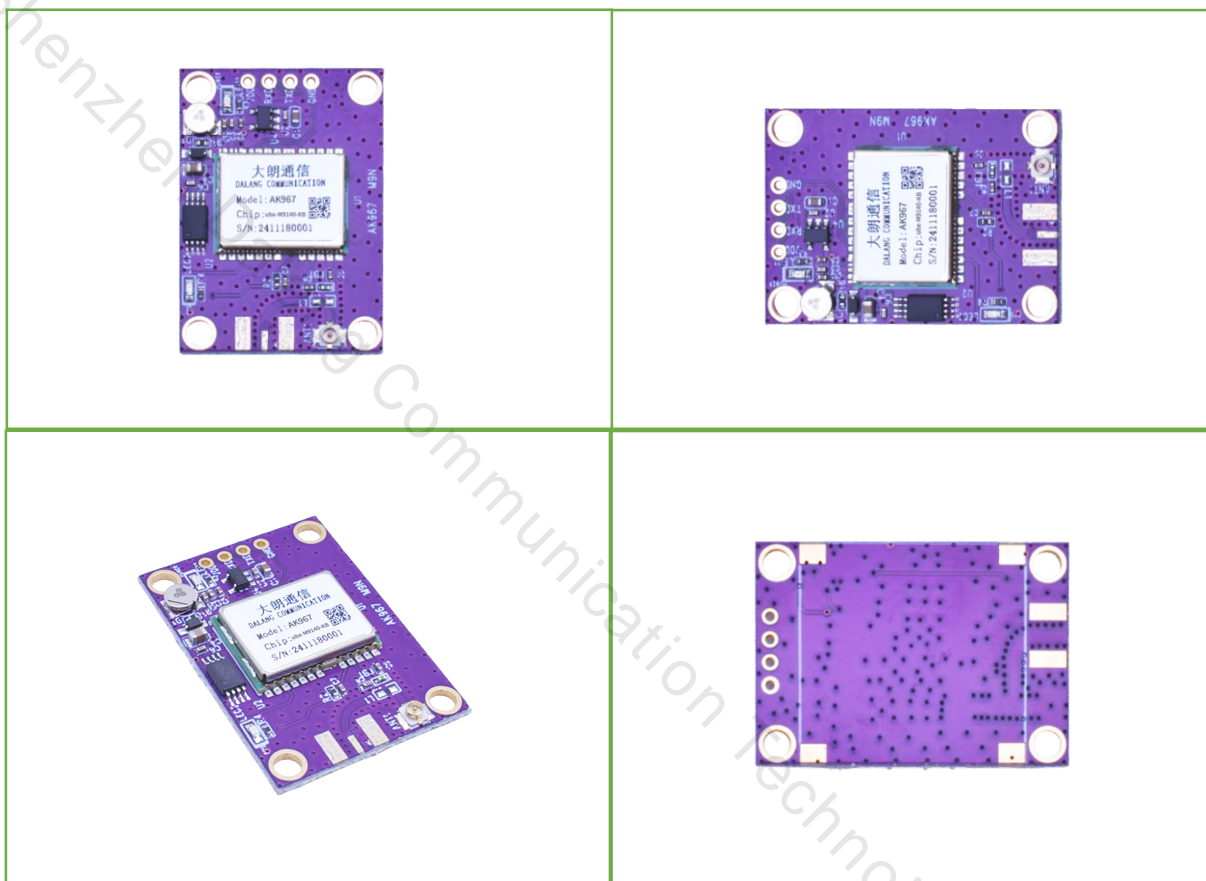


Figure 3 Product Images