Product summary

ZED-F9P series

u-blox F9 high precision GNSS modules

Standard

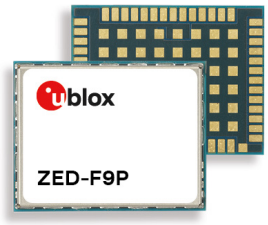
Professional

Automotive

Multi-band receiver delivers centimeter-level accuracy in seconds

- Concurrent reception of GPS, GLONASS, Galileo and BeiDou
- Multi-band RTK with fast convergence times and reliable performance
- Centimeter-level accuracy in a small and energy-efficient module
- Easy integration of RTK for fast time-to-market
- Native support for PointPerfect simplifies integration

17.0 × 22.0 × 2.4 mm



Product description

The ZED-F9P positioning module integrates multi-band GNSS and real time kinematics (RTK) technology in a compact form factor, to deliver centimeter-level accuracies in seconds for the industrial navigation and robotics markets.

ZED-F9P concurrently uses GNSS signals from the GNSS constellations GPS, GLONASS, Galileo, BeiDou, and NavIC. GNSS signals from multiple frequency bands combined with RTK technology enables fast convergence times and reliable performance for scalable applications, including robotic lawnmowers, unmanned autonomous vehicles (UAV), and semi-automated or fully automated machinery.

With its high update rate and low power consumption levels, the ZED-F9P module is ideal for highly dynamic applications such as UAVs. ZED-F9P ensures the security of positioning and navigation information by using secure interfaces and advanced jamming and spoofing detection technologies. The receiver enables easy integration and helps product developers quickly bring their ideas to the market.

ZED-F9P offers support for a range of correction services allowing each application to optimize performance according to the application's unique set of needs. ZED-F9P comes with built-in support for standard RTCM corrections, supporting centimeter-level navigation from local base stations or from virtual reference stations (VRS) in a Network RTK setup. The module supports SPARTN format SSR-type correction services suitable for mass market applications.

u-blox modules are manufactured in ISO/TS 16949 certified sites and are fully tested on a system level. Qualification tests are performed as stipulated in the ISO16750 standard: "Road vehicles – Environmental conditions and testing for electrical and electronic equipment".

	ZED-F9P-0xB	ZED-F9P-1xB
Grade		
Automotive		
Professional	•	•
Standard		
GNSS		
GPS + QZSS / SBAS	•	•
GLONASS	•	•
Galileo	•	•
BeiDou	•	•
Number of concurrent GNSS	4	4
Multi-band	L1/L2	L1/L5
Compatible u-blox services		
AssistNow™	•	•
PointPerfect	•	•
Interfaces		
UART	2	2
USB	1	1
SPI	1	1
DDC (I2C compliant)	1	1
Features		
Programmable (flash)	•	•
Data logging	•	•
Carrier phase output	•	•
Additional SAW	•	•
RTC crystal	•	•
Oscillator	T	T
RTK rover	•	•
RTK base station	•	•
Moving base	•	
Survey-in and fixed mode	•	•
Timepulse	1	1
Power supply		
2.7 V – 3.6 V	•	•

T = TCXO

ZED-F9P series

Features

Receiver type	184-channel u-blox F9 engine GPS L1C/A, GLO L1OF, GAL E1B/C, BDS B1I, QZSS L1C/A L1S L5, SBAS L1C/A **ZED-F9P-0xB**: GPS L2C, GLO L2OF, GAL E5b, BDS B2I, QZSS L2C **ZED-F9P-1xB**: GPS L5, GAL E5a, BDS B2a, NavIC L5	
Nav. update rate	RTK	up to 20 Hz[1]
Position accuracy[2]	RTK	0.01 m + 1 ppm CEP
Convergence time[2]	RTK	< 10 sec
Acquisition	Cold starts Aided starts Reacquisition	24 s 2 s 2 s
Sensitivity	Tracking & Nav. Cold starts Hot starts Reacquisition	-167 dBm -148 dBm -157 dBm -160 dBm
Assistance	AssistNow Online OMA SUPL & 3GPP compliant	
Oscillator	TCXO	
RTC crystal	Built-in	
Anti-jamming	Active CW detection and removal Onboard band pass filter	
Anti-spoofing	Advanced anti-spoofing algorithms	
Memory	Flash	
Moving base	For attitude sensing and heading applications	
Supported antennas	Active	

1 The highest navigation rate can limit the number of supported constellations
2 Depends on atmospheric conditions, baseline length, GNSS antenna, multipath conditions, satellite visibility, and geometry

Interfaces

Serial interfaces	2 UART 1 SPI 1 USB 1 DDC (I2C compliant)
Digital I/O	Configurable timepulse EXTINT input for wakeup RTK fix status GEOFENCE status
Timepulse	Configurable: 0.25 Hz to 10 MHz
Protocols	NMEA, UBX binary, RTCM v. 3.3, SPARTN v. 2.0

Package

54-pin LGA (land grid array), 17 x 22 x 2.4 mm

Environmental data, quality, and reliability

Operating temp.	-40 °C to +85 °C
Storage temp.	-40 °C to +85 °C
Vibration	MIL-STD-810G (Category 24, 7.7g RMS)
RoHS compliant (2015/863/EU)	
Green (halogen-free)	
EU Radio Equipment Directive compliant 2014/53/EU	
Qualification according to ISO 16750	
Manufactured and fully tested in ISO/TS 16949 certified production sites	

Electrical data

Supply voltage	2.7 V to 3.6 V
Power consumption	68 mA at 3.0 V (continuous)
Backup supply	1.65 V to 3.6 V

Compatible u-blox products and services

Products	NEO-D9S correction receiver NEO-D9C correction receiver
Location services	AssistNow A-GNSS service PointPerfect GNSS augmentation service

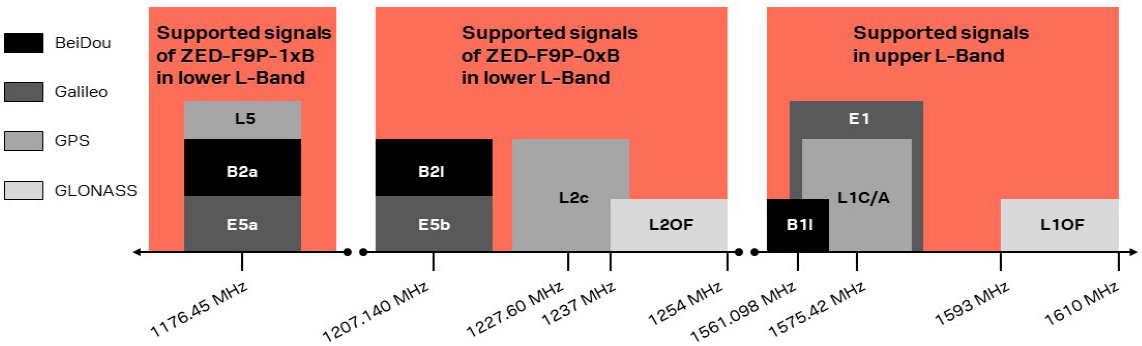
Support products

u-blox support products provide reference design, and allow efficient integration and evaluation of u-blox positioning technology.

EVK-F9P-01	u-blox ZED-F9P-0xB evaluation kit with ANN-MB multi-band antenna
EVK-F9P-16	u-blox ZED-F9P-1xB evaluation kit with ANN-MB1 multi-band antenna

Product variants

ZED-F9P-02B	u-blox high precision GNSS module with SBAS
ZED-F9P-04B	u-blox high precision GNSS module with SPARTN and CLAS
ZED-F9P-15B	u-blox high precision GNSS module with L1/L5



Further information

For contact information, see **www.u-blox.com/contact-u-blox**.
For more product details and ordering information, see the product data sheet.