

ZED-F9P module



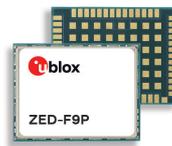
u-blox F9 high precision GNSS module

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
- High update rate for highly dynamic applications
- Centimeter accuracy in a small and energy-efficient module
- Easy integration of RTK for fast time-to-market



17.0 × 22.0 × 2.4 mm



Product description

The ZED-F9P positioning module features the u-blox F9 receiver platform, which provides multi-band GNSS to high-volume industrial applications in a compact form factor.

ZED-F9P is a multi-band GNSS module with integrated u-blox multi-band RTK technology for centimeter-level accuracy. The module enables precise navigation and automation of moving industrial machinery by means of a small, surface-mounted module.

The ZED-F9P module is designed for easy integration and low design-in costs with minimal e-BOM. Thanks to its small package size, light weight, and small power consumption it is well-suited for mass market adoption.

ZED-F9P ensures the security of positioning and navigation information by using secure interfaces and advanced jamming and spoofing detection technologies.

ZED-F9P offers support for a range of correction services allowing each application to optimize performance according to the application's individual need. 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

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

T = TCXO

ZED-F9P module



Features

Receiver type	184-channel u-blox F9 engine GPS L1C/A L2C, GLO L1OF L2OF, GAL E1B/C E5b, BDS B1I B2I, QZSS L1C/A L1S L2C, SBAS L1C/A	
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	24 s
	Aided starts	2 s
	Reacquisition	2 s
Sensitivity	Tracking & Nav.	-167 dBm
	Cold starts	-148 dBm
	Hot starts	-157 dBm
	Reacquisition	-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. 1.8

Package

54-pin LGA (Land Grid Array)
17 x 22 x 2.4 mm

Environmental data, quality & reliability

Operating temp.	-40 °C to +85 °C
Storage temp.	-40 °C to +85 °C
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	
High vibration and shock resistance	

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

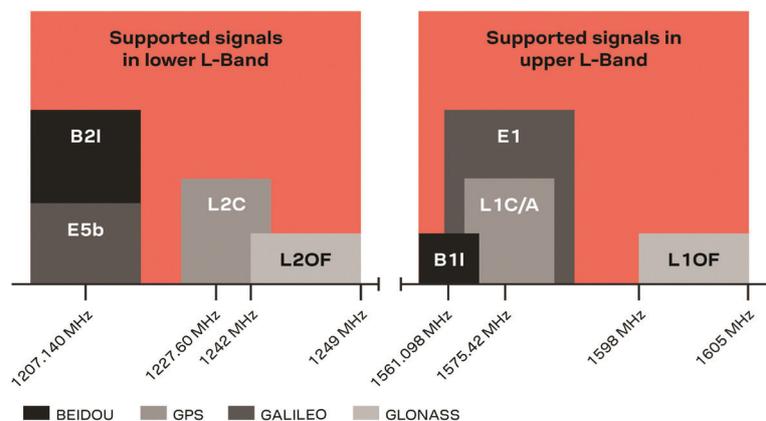
Support products

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

C099-F9P	u-blox ZED-F9P application board, with ODIN-W2 for connectivity. Includes multi-band antenna (ANN-MB). One board per package.
----------	---

Product variants

ZED-F9P-01B	u-blox high precision GNSS module with rover and base functionality
ZED-F9P-02B	u-blox high precision GNSS module adding SBAS
ZED-F9P-03B	u-blox high precision GNSS module adding SPARTN



Further information

For contact information, see www.u-blox.com/contact-us.

For more product details and ordering information, see the product data sheet.

Legal Notice:

u-blox reserves all rights to this document and the information contained herein. Products, names, logos and designs described herein may in whole or in part be subject to intellectual property rights. Reproduction, use, modification or disclosure to third parties of this document or any part thereof without the express permission of u-blox is strictly prohibited.

The information contained herein is provided "as is". No warranty of any kind, either express or implied, is made in relation to the accuracy, reliability, fitness for a particular purpose or content of this document. This document may be revised by u-blox at any time. For most recent documents, please visit www.u-blox.com.
Copyright © 2021, u-blox AG