Product Summary

ZED-F9P
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

Product description
The ZED-F9P positioning module features the new 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. It is well-suited for mass market adoption, thanks to its small package size, light weight, and small power consumption.

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 can be upgraded to support future SSR-type correction services suitable for mass market penetration.

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”.

UBX-17001511 - R05
ZED-F9P

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 L2C
- **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 -167 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, EXINT input for wakeup, RTK fix status, GEOFENCE status
- **Timepulse**: Configurable: 0.25 Hz to 10 MHz
- **Protocols**: NMEA, UBX binary, RTCM version 3.3

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)**
- **ETSI-RED compliant**
- **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 @ 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**: u-blox F9 high precision GNSS module with rover and base functionality

Further information

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