Product summary

**ZED-F9R module**

**Fully integrated high precision sensor fusion solution**

**High precision sensor fusion for ultimate performance**
- Continuous navigation in most challenging environments
- Low latency and high update rate for real time applications
- Fully integrated solution for fast time-to-market
- Fast RTK convergence times
- Full GNSS raw data support

**Product description**

The ZED-F9R positioning module features the u-blox F9 receiver platform providing a reliable multi-band GNSS sensor fusion solution for industrial applications in a compact form factor. The wide bandwidth allows to receive many satellites in parallel, resulting in high availability of RTK solutions and quick convergence time.

The high performance sensor fusion module has an integrated inertial measurement unit (IMU) for RTK positioning. The sophisticated built-in algorithms fuse the IMU data, GNSS measurements, wheel ticks, correction data, and a vehicle dynamics model to provide optimal positioning accuracy where GNSS alone would fail.

The module operates under open sky, in the wooded countryside, in difficult multipath environments, and even in covered areas. Designed for autonomous industrial applications like agricultural machinery or heavy trucks, ZED-F9R is the ultimate solution for modern autonomous industrial applications where control and position availability are key to success.

The device is a turnkey self-contained solution, which provides the best possible performance: no latencies or similar system considerations to worry about. This eliminates the technical risk and effort of selecting and integrating RF components and third-party libraries such as precise positioning engines. ZED-F9R offers support for a range of correction services allowing each application to optimize performance according to the application’s unique needs. ZED-F9R comes with built-in support for RTCM-formatted corrections, enabling high precision navigation using internet or satellite data connectivity.

The ZED-F9R modules use GNSS chips qualified according to AEC-Q100 and are manufactured in ISO/TS 16949 certified sites. Qualification tests are performed as stipulated in the ISO16750 standard: “Road vehicles – Environmental conditions and testing for electrical and electronic equipment”.

The ZED-F9R-00B professional grade module adheres to industrial standard quality specifications and production flow.
# ZED-F9R module

## Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiver type</td>
<td>184-channel u-blox F9 engine GPS L1C/A L2C, GLO L1OF L2OF, GAL E1B/C E5b, BDS B1I B2I, QZSS L1C/A L2C</td>
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<tr>
<td>Nav. update rate</td>
<td>Up to 30 Hz</td>
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<tr>
<td>Position accuracy</td>
<td>RTK &lt; 0.2 m + 1 ppm CEP</td>
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<tr>
<td>ADR position error</td>
<td>&lt; 2% of distance traveled without GNSS</td>
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<tr>
<td>Convergence time</td>
<td>RTK &lt;10 s</td>
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<tr>
<td>Acquisition</td>
<td>Cold starts 24 s, Aided starts 4 s, Reacquisition 2 s</td>
</tr>
<tr>
<td>Built-in</td>
<td>TCXO, RTC, flash memory, 3D accelerometer, 3D gyroscope, diplexer, SAW filters</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>Tracking &amp; nav. 1 -160 dBm, Cold starts -147 dBm, Hot starts -158 dBm</td>
</tr>
<tr>
<td>Supported antennas</td>
<td>Active</td>
</tr>
<tr>
<td>Software features</td>
<td>AssistNow Online, OMA SUPL &amp; 3GPP compliant, Active CW detection and removal, Onboard band pass filter, Advanced anti-spoofing algorithms</td>
</tr>
<tr>
<td>Raw data</td>
<td>Carrier phase, Code phase, Pseudoranges, IMU data output</td>
</tr>
<tr>
<td>Protocols</td>
<td>NMEA, UBX binary, RTCM version 3.3</td>
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</tbody>
</table>

## 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 (lead-free, 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
- Uses u-blox F9 chips qualified according to AEC-Q100

## Support products

- C102-F9R: Easy to use evaluation board with various communication interfaces

## Product variants

- ZED-F9R-00B: u-blox F9 dual band GNSS module with high precision sensor fusion

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### Further information

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

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