Product summary

ZED-F9L module

Sub-meter dead reckoning GNSS with integrated IMU sensors

Standard

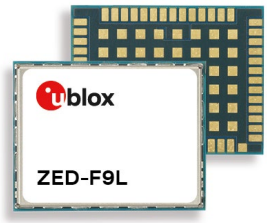
Professional

Automotive

Reliable positioning for telematics and V2X applications for use up to 105 °C

- Fully integrated L1/L5 dead reckoning at up to 50 Hz with very low latency
- Maximum position availability with all constellations tracked simultaneously
- Multiple outputs to serve all possible architectures
- Dependable protection level output
- Advanced security thanks to top-notch spoofing and jamming algorithms
- Automotive and motorcycle dedicated motion models available

17.0 × 22.0 × 2.4 mm



Product description

The ZED-F9L-10A module features the u-blox F9 platform, which provides continuous sub-meter-level positioning accuracy with SBAS for the most challenging automotive use cases, including motorcycle applications. The receiver brings satellite availability in urban areas to a new level by simultaneous tracking of L1/L5-band signals and 6 GNSS constellations, including NavIC.

With its sophisticated built-in algorithms, the module fuses GNSS measurements, IMU data, wheel ticks, and vehicle dynamics, resulting in reliable positioning and attitude even when GNSS services are unavailable. It delivers multiple GNSS and IMU outputs in parallel to support all possible architectures, including a 50 Hz sensor-fused solution with very low latency.

The device is a self-contained solution, which provides the best possible system performance to address issues such as latency constraints, RF front-end design issues, or dead reckoning algorithm integration. This eliminates the technical risk and effort of selecting and integrating RF components and third-party libraries, like positioning engines, which helps customers optimize time to market. The u-blox position engine incorporates a dependable protection level output and advanced security features including sensor-based anti-spoofing and anti-jamming techniques. Operation up to 105 °C makes it possible to integrate the product anywhere in the car without design constraints. The ZED form factor enables an upgrade path to RTK technology with the pin-to-pin compatible ZED-F9K module. The u-blox approach dramatically reduces supply chain complexity during production.

Manufacturing partners use ISO/TS 16949 certified sites and adhere to the latest standards in the automotive industry. Qualification tests are performed as stipulated in the AEC-Q104 standard: “Failure mechanism based stress test qualification for multichip modules (MCM) in automotive applications”.

	ZED-F9L
Grade	
Automotive	•
Professional	
Standard	
GNSS	
GPS / QZSS	•
GLONASS	•
Galileo	•
BeiDou	•
NavIC	•
Number of concurrent GNSS	6
Multi-band L1/L5	•
Interfaces	
UART	2
USB	1
SPI	1
DDC / I2C	1
Features	
Programmable (flash)	•
Additional SAW	•
RTC crystal	•
Oscillator	T
Timepulse	2
Power supply	
2.7 V – 3.6 V	•

T = TCXO

ZED-F9L module

Features

Receiver type	184-channel u-blox F9 engine GPS L1/L5, Galileo E1/E5a, GLONASS L1, BeiDou B1I/B2a, QZSS L1/L5, SBAS L1
Nav. update rate[1]	up to 50 Hz
Position accuracy	< 1 m (68%)
ADR position error	< 1% of distance travelled without GNSS
Acquisition	Cold starts 24 s Aided starts 4 s Reacquisition 2 s
Sensitivity	Tracking & nav.[1] -160 dBm Cold starts -147 dBm Hot starts -158 dBm
Built-in	TCXO, RTC, flash memory, 3D accelerometer, 3D gyroscope, diplexer, SAW filters
Supported antennas	Active

1 Limited by firmware for best DR performance

Software features

Anti-jamming	Advanced anti-jamming algorithms
Anti-spoofing	Advanced anti-spoofing algorithms Sensor based spoofing detection
Raw data	Code and Doppler measurements and IMU data
Protocols	NMEA, UBX binary, RTCM version 3.3

Interfaces

Serial interfaces	2 UART 1 USB 1 SPI (optional) 1 DDC / I2C
Digital I/O	Configurable timepulse
Timepulse	Configurable: 0.25 Hz to 10 MHz

Electrical data

Supply voltage	2.7 V to 3.6 V
Power consumption	85 mA at 3.0 V (continuous)
Backup supply	1.65 V to 3.6 V

Package

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

Environmental data, quality & reliability

Operating temp.	−40 °C to +105 °C
Storage temp.	−40 °C to +105 °C

RoHS compliant (lead-free, 2015/863/EU)

Green (halogen-free)

EU Radio Equipment Directive compliant 2014/53/EU

Module qualification according to AEC-Q104

Manufactured and fully tested in ISO/TS 16949 certified production sites

Uses u-blox F9 chips qualified according to AEC-Q100

Compatible u-blox products and services

Location services	AssistNow A-GNSS service

Support products

EVK-F9DR	Easy to use evaluation board with various communication interfaces

Product variants

ZED-F9L-11A	u-blox F9 multi-band GNSS dead reckoning module, L1/L5 bands. Automotive grade, up to 105 °C

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.

Legal Notice:

u-blox or third parties may hold intellectual property rights in the products, names, logos and designs included in this document. Copying, reproduction, or modification of this document or any part thereof is only permitted with the express written permission of u-blox. Disclosure to third parties is permitted for clearly public documents only.

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 © 2026, u-blox AG