Product summary

ZED-F9K-01A module

High precision dead reckoning with integrated IMU sensors

Standard

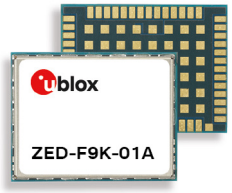
Professional

Automotive

Reliable lane identification for ADAS applications up to 105 °C

- Fully integrated dead reckoning RTK solution up to 50 Hz with very low latency
- Multi-band operation for flexibility and security
- Multiple outputs to serve all possible architecture
- Dependable protection level output
- Advanced security by top-notch spoofing & jamming algorithms
- Native support of global PointPerfect augmentation

17.0 × 22.0 × 2.4 mm



Product description

The ZED-F9K-01A module features the u-blox F9 GNSS platform, which provides continuous decimeter-level positioning accuracy for the most challenging automotive use cases. It supports both L1/L2/E5B and L1/L5 bands for maximum flexibility, satellite availability, and security. The sophisticated built-in algorithms cleverly fuse the IMU data, GNSS measurements, wheel ticks, and vehicle dynamics model to identify driving lanes where GNSS alone would fail.

The module natively supports the u-box PointPerfect GNSS augmentation service. 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. It also enables advanced real-time applications like augmented reality, while the optimized multi-band and multi-constellation capability maximizes the number of visible satellites even in urban conditions.

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 RTK 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 approach also dramatically reduces supply chain complexity during production.

The u-blox position engine incorporates a dependable protection level output and advanced security features including anti-spoofing and anti-jamming. Operation up to 105 °C makes it possible to integrate the product anywhere in the car without design constraints.

u-blox 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-F9K-01A
Grade	
Automotive	•
Professional	
Standard	
GNSS	
GPS / QZSS	•
GLONASS	•
Galileo	•
BeiDou	•
Number of concurrent GNSS	4
Multi-band	•
Interfaces	
UART	2
USB	1
SPI	1
DDC (I2C compliant)	1
Features	
Programmable (Flash)	•
Additional SAW	•
RTC crystal	•
Oscillator	T
OSR correction support	•
PointPerfect support	•
Timepulse	1
Power supply	
2.7 V – 3.6 V	•

T = TCXO

ZED-F9K-01A module

Features

Receiver type	184-channel u-blox F9 engine Option A: GPS L1/L2C, Galileo E1/E5b, GLONASS L1/L2, BeiDou B1I/B2I, QZSS L1/L2C, SBAS L1 Option B: GPS L1/L5, Galileo E1/E5a, GLONASS L1, BeiDou B1I/B2a, QZSS L1/L5, SBAS L1	
Nav. update rate	up to 50 Hz	
Position accuracy	RTK	< 0.2 m + 1 ppm CEP
ADR position error	< 1% of distance travelled without GNSS	
Convergence time	RTK	< 10 s
Acquisition	Cold starts Aided starts Reacquisition	24 s 4 s 2 s
Sensitivity	Tracking & nav.[1] Cold starts Hot starts	-160 dBm -147 dBm -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 compliant)
Digital I/O	Configurable timepulse
Timepulse	Configurable: 0.25 Hz to 10 MHz

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	

Electrical data

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

Related u-blox products and services

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

Support products

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

Product variants

ZED-F9K-01A	u-blox F9 multi-band high precision dead reckoning, automotive grade. L1/L2/E5b or L1/L5 bands, 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.