Product Summary

ZED-F9T

u-blox F9 high accuracy timing module

Standard

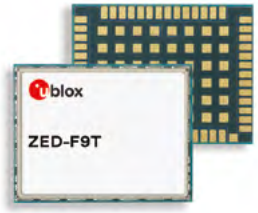
Professional

Automotive

Multi-band GNSS receiver with nanosecond-level timing accuracy

- Meets the most stringent 5G timing requirements
- Ideal for global deployments due to GPS, BeiDou, Galileo, and GLONASS reception
- Unaffected by ionospheric errors
- Differential timing mode for highly accurate local timing
- Built-in security for highest robustness against malicious attacks

17.0 × 22.0 × 2.4 mm



Product description

The ZED-F9T timing module provides nanosecond-level timing accuracy to the most demanding infrastructure applications.

ZED-F9T is designed to meet the most stringent timing synchronization requirements in 5G mobile networks on a global scale. By significantly reducing the time error of the primary source of cellular network synchronization, the ZED-F9T will help operators maximize the performance of their networks and so optimize the return on their investment in 5G communications.

The timing module's multi-band capability reduces the timing error under clear skies to less than 5 ns without the need for an external GNSS correction service. To further improve accuracy locally, the ZED-F9T features differential timing modes that exchange correction data with other neighboring GNSS timing receivers via a communication network.

Multi-band access to all four satellite constellations strengthens the receiver's capability for delivering more reliable performance.

ZED-F9T includes advanced security features such as secure boot, secure interfaces, and T-RAIM to provide the highest level timing integrity.

The module has a single RF input for all the GNSS bands and dual SAW filters for exceptional signal selectivity and out-of-band attenuation.

u-blox modules use GNSS chips qualified according to AEC-Q100, 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-F9T
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)	•
Data logging	•
Carrier phase output	•
Additional SAW	•
RTC crystal	•
Oscillator	T
Survey-in and fixed mode	•
Time pulse output	2
Time mark input	2
Power supply	
2.7 V – 3.6 V	•

T = TCXO

ZED-F9T

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 SBAS L1C/A: WAAS, EGNOS, MSAS, GAGAN	
Nav. update rate[1]		up to 20 Hz
Position accuracy[2]	Standalone	2.0 m CEP
Acquisition	Cold starts Aided starts Reacquisition	26 s 2 s 1 s
Sensitivity	Tracking & Nav. Reacquisition Hot starts Cold starts	-166 dBm -160 dBm -157 dBm -148 dBm
Assistance	AssistNow Online OMA SUPL & 3GPP compliant	
Oscillator	TCXO	
RTC crystal	Built-In	
Anti-jamming	Active CW detection and removal Dual onboard band pass filters	
Anti-spoofing	Advanced anti-spoofing algorithms	
Security	Secure boot Secure firmware update	
Memory	Flash	
Supported antennas	Active	

1 The highest navigation rate can limit the number of supported constellations
2 Depends on atmospheric conditions, GNSS antenna, multipath conditions, satellite visibility, and geometry

Features - Timing

Timing accuracy	<5 ns (1-sigma, clear sky, absolute mode) <2.5 ns (1-sigma, clear sky, differential mode)
Time pulse frequency	0.25Hz – 25 MHz
Time pulse jitter	±4 ns
Time mark resolution	8 ns
Integrity reports	T-RAIM active, phase uncertainty Time pulse rate/duty-cycle, inter-constellation biases
Survey-in period	Configurable

Features - Raw data

Measurement data	Carrier phase, code phase & pseudo-range, Doppler on all signals
Message data	GPS, GLONASS, BeiDou, Galileo, QZSS, SBAS

Package

54-pin LGA (Land Grid Array)
17.0 x 22.0 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)	
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	
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

Interfaces

Serial interfaces	1 USB 2 UART 1 SPI 1 DDC (I^2C compliant)
Protocols	NMEA, UBX binary, RTCM version 3.3
Time pulse output	2
Time mark input	2

Support products

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

RCB-F9T	u-blox F9 multi-band GNSS timing board
ANN-MB	Multi-band active GNSS antenna

Product variants

ZED-F9T	u-blox F9 high accuracy timing module

Further information

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

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