Product summary

ZED-X20T series

u-blox X20 all-band high accuracy timing modules

Standard

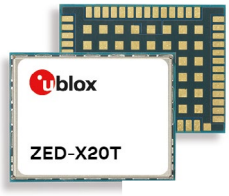
Professional

Automotive

All-band GNSS receiver with Galileo HAS support for superior timing accuracy

- All-band receiver with enhanced ionospheric error mitigation
- Built-in support for Galileo High Accuracy Service (HAS), delivered via the E6 signal
- Delivers superior timing accuracy by combining all-band reception with Galileo HAS corrections
- Supports Galileo OSNMA for enhanced security
- Easy upgrade path from pin-compatible ZED-F9T to ZED-X20T

17.0 × 22.0 × 2.4 mm



Product description

Based on the u-blox X20 platform, ZED-X20T timing modules set a new standard in timing accuracy and reliability.

ZED-X20T concurrently processes signals from the GPS, Galileo, BeiDou, GLONASS, QZSS, and NavIC constellations across all GNSS bands. This gives it enhanced capabilities to mitigate ionospheric errors, one of the largest sources of timing error in GNSS receivers. The all-band reception forms the foundation for superior timing performance in demanding environments and applications, such as modern communication networks and data centers.

To further improve timing accuracy, ZED-X20T offers built-in support for the Galileo High Accuracy Service (HAS). Galileo HAS corrections are broadcast free of charge on the Galileo E6 signal and received directly by the module. No external GNSS correction service or communication link is needed, which reduces the total solution cost. By combining all-band reception with Galileo HAS corrections, ZED-X20T delivers superior timing accuracy on a global scale.

ZED-X20T includes advanced security features such as secure boot, secure interfaces, and T-RAIM to provide the highest level of timing integrity. Galileo OSNMA (Open Service Navigation Message Authentication) adds further resilience by authenticating the navigation data used by the receiver, protecting against spoofing attacks. The navigation data is validated according to the U.S. Department of Homeland Security GPS Receiver Allow List Development Guide.

ZED-X20T is pin-compatible with ZED-F9T, giving customers an easy upgrade path. Existing ZED-F9T designs can move to ZED-X20T with minimal design effort, gaining all-band performance and HAS support while protecting their investment.

	ZED-X20T-00B	ZED-X20T-10B
Grade		
Automotive		
Professional	•	•
Standard		
GNSS		
GPS	•	•
Galileo	•	•
BeiDou	•	•
GLONASS	•	•
QZSS	•	•
NavIC	•	•
SBAS	•	•
All-band	L1/L2/L5/L6	L1/L2/L5/L6
Interfaces		
UART	2	2
USB	1	1
SPI	1	1
DDC (I2C compliant)	1	1
Features		
Galileo HAS	•	•
Galileo OSNMA	•	•
Carrier phase output	•	•
Programmable (Flash)	•	•
Additional SAW	•	•
RTC crystal	•	•
Oscillator	Internal TCXO	External oscillator input
Survey-in and fixed mode	•	•
Time pulse output	2	2
Time mark input	2	2
Power supply		
2.7 V – 3.6 V	•	•

ZED-X20T series

Features

Receiver type	672-channel u-blox X20 engine GPS L1C/A, L2C, L5 GAL E1B/C, E5a, E6 BDS B1I, B1C, B2a, B3I GLO L1OF, L2OF QZSS L1C/A, L1C/B, L2C, L5 NavIC L5 SBAS L1	
Nav. update rate [1]	up to 20 Hz	
Position accuracy [2]	Standalone	1.5 m CEP
Acquisition	Cold starts	26 s
	Aided starts	2 s
	Reacquisition	2 s
Sensitivity	Tracking and Nav.	-167 dBm
	Reacquisition	-160 dBm
	Hot starts	-157 dBm
	Cold starts	-148 dBm
Assistance	AssistNow Live Orbits OMA SUPL and 3GPP compliant	
Oscillator	ZED-X20T-00B: Internal TCXO ZED-X20T-10B: External oscillator input	
RTC crystal	Built-in	
Anti-jamming	Active CW detection and removal Onboard band-pass filters	
Anti-spoofing	Advanced anti-spoofing algorithms Galileo OSNMA	
Security	Secure boot Secure firmware update	
Memory	Flash	
Supported antennas	Active	

Features - Timing

Timing accuracy [2]	< 2.5 ns (1-sigma, clear sky, without HAS) < 2.0 ns (1-sigma, clear sky, with HAS)
Time pulse frequency	0.25Hz – 25 MHz
Time pulse jitter	±650 ps
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, and pseudo-range, Doppler on all signals
Message data	GPS, Galileo, BeiDou, GLONASS, QZSS, NavIC, SBAS

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

Package

54-pin LGA (Land Grid Array)
17.0 x 22.0 x 2.4 mm

Environmental data, quality and reliability

Operating temp.	−40 °C to +85 °C
Storage temp.	−40 °C to +85 °C
RoHS compliant (lead-free)	
ETSI-RED compliant	
Qualified according to u-blox qualification policy, based on a subset of AEC-Q104	
Manufactured and fully tested in ISO/TS 16949 certified production sites	

Electrical data

Supply voltage	2.7 V to 3.6 V
Power consumption	55 mA @ 3.0 V (continuous)
Backup supply	1.65 V to 3.6 V

Interfaces

Serial interfaces	2 UART 1 USB 1 SPI 1 DDC (I2C compliant)
Protocols	NMEA, UBX binary, RTCM
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.

EVK-X20T	u-blox X20 GNSS timing evaluation kit
ANN-MB2	All-band high-precision GNSS antenna

Product variants

ZED-X20T-00B	u-blox X20 all-band high accuracy timing module, with internal TCXO
ZED-X20T-10B	u-blox X20 all-band high accuracy timing module, with external oscillator input

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 and product statuses, please visit www.u-blox.com.

UBXDOC-869164769-1021056 - R01

Copyright © 2026, u-blox AG