

UBX-G8020-KT

u-blox 8 GPS chip



5.00 × 5.00 × 0.59 mm

Cost-efficient low power GPS chip

- GNSS engine for GPS/QZSS and GLONASS
- High sensitivity of -166 dBm
- Low power consumption
- Advanced jamming and spoofing detection
- Superior performance for wrist worn devices
- Pin-compatible with UBX-G7020-KT and UBX-M8030-KT

Product description

The UBX-G8020-KT GNSS chip, based on the latest u-blox 8 position engine, supports GPS/QZSS, GLONASS, and SBAS. With superior sensitivity and acquisition times, it sets new standards for single constellation receivers.

UBX-G8020-KT chip is targeted for applications where small size, high performance, minimal power, and low system costs are all a must. With a dedicated mode for wrist worn applications, UBX-G8020-KT is a perfect choice for wearable devices. UBX-G8020-KT features low power consumption and supports advanced Power Save Modes. It also provides message integrity protection, geofencing, spoofing detection, odometer, and data logging functionalities.

The UBX-G8020-KT is available in an industry standard QFN package. Featuring built-in LNA, LDOs and DC/DC converter, and a small external BOM, the UBX-G8020-KT enables ultra-small solutions with a footprint of only ~50 mm². By supporting TCXOs or lower price oscillators, the UBX-G8020-KT further ensures a minimal Total-Cost-of-Ownership.

UBX-G8020-KT was built with backward compatibility in mind, thus simplifying migration from existing u-blox G7020-KT designs.

With its rigorous quality and manufacturing standards (AEC-Q100, ISO/TS 16949), UBX-G8020-KT meets the requirements for industrial and consumer applications.

Product selector

Model	Package	Category	GNSS				Supply	Interfaces	Features	Grade	
	Package	Standard Precision GNSS High Precision GNSS Dead Reckoning Timing	GPS/QZSS	GLONASS	Galileo	BeiDou	Number of concurrent GNSS	1.4 V - 3.6 V	UART USB SPI DDC (I ² C compliant)	Programmable (Flash) Data logging RTC crystal Oscillator Antenna supply and supervisor Timepulse	Standard Professional Automotive
UBX-G8020-KT	QFN40	•	•	•		1	•	• • • •	S S C/T S 2	•	

C/T = Crystal and TCXO supported / S = supported, may require external components



Features

Receiver type	72-channel u-blox 8 engine GPS/QZSS L1 C/A, GLONASS L10F SBAS L1 C/A: WAAS, EGNOS, MSAS	
Time to first fix ¹	GPS	GLONASS
Cold starts:	29 s	30 s
Aided start:	2 s	2 s
Hot start:	1 s	1 s
Sensitivity ¹		
Tracking & Nav:	-166 dBm	-166 dBm
Reacquisition:	-160 dBm	-156 dBm
Cold start:	-148 dBm	-145 dBm
Hot start:	-157 dBm	-156 dBm
Max nav. update rate	Up to 18 Hz	
Horizontal Pos. Accuracy	GPS 2.5 m CEP	GLONASS 4.0 m CEP
Multi-GNSS Assistance	AssistNow GNSS Online AssistNow GNSS Offline (up to 35 days) AssistNow Autonomous (up to 6 days)	
Oscillator	Supports Crystal or TCXO	
LNA	Built-in	
RTC input	32.768 kHz (optional), RTC can be derived from GNSS Crystal	
Antenna supervision	Short and open circuit detection supported with external circuit	
DC/DC converter	Built-in, external component required	
Anti Jamming	Active CW detection and removal	
Raw Data	Code phase output	
Odometer	Integrated in navigation filter	
Geofencing	Up to 4 circular areas; GPIO for waking up external CPU	
Spoofing detection	Built-in	
Signal integrity	Signature feature with SHA 256	
Data logging ²	For position, velocity, time, and odometer data	

1 = with TCXO

2 = External Flash required

Package

UBX-G8020-KT: 40 Pin QFN: 5.00 x 5.00 x 0.59 mm

Environmental data, quality & reliability

Operating temp.	-40 °C to +85 °C
Storage temp.	-40 °C to +125 °C
Humidity	JEDEC MSL 1
RoHS compliant (lead-free) and green (no halogens)	
Qualification according to AEC-Q100	
Manufactured in ISO/TS 16949 certified production sites	

Electrical data

Supply voltage	1.4 V to 3.6 V
Digital I/O voltage level	1.65 V to 3.6 V
Power consumption	16 mA @ 3.0 V (continuous mode) 3.7 mA @ 3.0 V (PSM, 1 Hz update)
Backup Supply	1.4 V to 3.6 V

Interfaces

Serial interfaces	1 UART 1 USB V2.0 compatible 1 DDC (I ² C compliant) 1 SPI
Digital I/O	2 configurable time pulses 2 EXTINT interrupt inputs 2 PIO for antenna supervision

Support products

Easy-to-use kits to get familiar with u-blox 8 positioning technology, evaluate functionality, and visualize GNSS performance.

EVK-8N u-blox 8 GNSS Evaluation Kit with TCXO

Product variants

UBX-G8020-KT u-blox 8 GNSS chip, 40 pin QFN

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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