Product Summary

UBX-M8230-CT

Super low power u-blox M8 GNSS chip

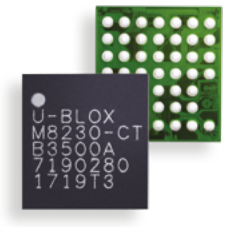
Standard

Professional

Automotive

Ideal for portable applications thanks to Super-E mode

- Super-E mode: ideal balance between low power and good performance
- Optimized for portable & wrist-worn applications
- System power optimization: LNA power saving and data batching
- Concurrent reception of GPS, GLONASS, BeiDou in Super-E mode
- Minimal board space: less than 30 mm^2



2.99 × 3.21 × 0.36 mm

Product description

The u-blox UBX-M8230-CT is an ultra low power GNSS chip optimized for wearable and portable applications. It features the new Super-E mode (Super-Efficient), providing a unique balance between power and performance. Compared with u-blox traditional 1 Hz full power mode, the Super-E mode provides up to 3 times the power savings while maintaining good position and speed accuracy. Average power consumption over a typical 30-minute track can be lower than 20 mW, while instantaneous tracking power is less than 10 mW. This is true even when using an industrial antenna design with moderate-to-low signal levels.

Super-E has a default performance setting for the best balance between power vs. performance. It also has a power save setting for additional power savings with potential compromise on performance.

The UBX-M8230-CT optimizes the overall system power consumption by excluding the need for any heavy signal processing on the application processor, and with external components, such as an external LNA, that can be automatically duty cycled. Navigation data can be stored internally while the application processor is in deep sleep (data batching).

Used in combination with multi-GNSS Assistance data, the UBX-M8230-CT not only features faster Time-to-First-Fix, but also ensures minimal power consumption, since A-GNSS enables the chip to maximize its power optimized period.

The UBX-M8230-CT only needs a few external components (e.g. SAW/LNA) to form a full GNSS solution with a footprint as small as 30 mm^2. It offers easy access to navigation data via multiple interfaces, such as SPI, I2C and UART.

Optimized for portable and wrist-worn applications, it provides an excellent level of positioning performance for such devices. The UBX-M8230-CT chip is an ideal choice for most wearable applications, such as watches, sport trackers and other applications where low power consumption and small size are key.

The UBX-M8230-CT is built on the u-blox M8 concurrent engine and supports two constellations simultaneously in Super-E mode, thus increasing the number of visible satellites compared to single-GNSS solutions. It also supports message integrity protection, anti-jamming, and anti-spoofing, providing reliable positioning in difficult environmental conditions as well as in security attack scenarios.

The UBX-M8230-CT chip is fully tested and qualified according to the JESD47 standard.

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 (I²C compliant)	Programmable (Flash)	Data logging	Data batching	RTC crystal	Oscillator	Antenna supply and supervisor	Timepulse	Standard	Professional	Automotive
UBX-M8230-CT	WL-CSP47	•				•	•	c	•	3	•	•		•	•		S	•	S	T			•		

c = only supported in continuous mode / S = supported, may require external components / T = TCXO

UBX-M8230-CT

Features

Receiver type	72-channel u-blox M8 engine GPS/QZSS L1 C/A, GLONASS L1OF BeiDou B1I, Galileo E1B/C 1 SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN	
Time to first fix		
Cold starts:	26 s	
Aided start:	2 s	
Hot start:	1 s	
	Super-E mode (default)	Continuous mode
Sensitivity[2]		
Tracking & Nav:	–160 dBm	–167 dBm
Reacquisition:	–160 dBm	–160 dBm
Cold start:	–148 dBm	–148 dBm
Hot start:	–157 dBm	–157 dBm
Max nav. update rate		
Single GNSS	Up to 4 Hz	up to 18 Hz
2 Concurrent GNSS	Up to 4 Hz	up to 10 Hz
Horizontal Pos. Accuracy	3.5 m CEP	2.5 m CEP
Multi-GNSS Assistance	AssistNow GNSS Online AssistNow GNSS Offline (up to 35 days) AssistNow Autonomous (up to 6 days) OMA SUPL & 3GPP compliant	
Oscillator	Supports TCXO	
Real Time Clock (RTC)	Can be derived from external RTC Clock	
LNA	Built-in	
DC/DC converter	Built-in, external component required	
Super-E mode	Super Efficient mode for lowest power	
Anti Jamming	Active CW detection and removal	
SQI Flash (optional) for	AssistNow Offline, AssitNow Autonomous, long term logging	
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[3] and Data batching	For position, velocity, time, and odometer data	

1 Galileo only supported in continuous mode
2 GPS+GLONASS
3 External Flash required

Interfaces

Serial interfaces	1 UART 1 DDC (I^2C compliant) 1 SPI
Digital I/O	1 EXTINT interrupt inputs
Memory	SQI interface for optional Flash

Package

UBX-M8230-CT: 47 Pin WL-CSP: 2.99 x 3.21 x 0.36 mm

Environmental data, quality & reliability

Operating temp.	–40 °C to +85 °C
Humidity	JEDEC MSL 1
RoHS compliant (lead-free) and green (no halogens)	
Qualification according to JESD47	

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[4]	36 mA @ 1.4 V (continuous mode, 1 Hz) 6 mA @ 1.4 V (Super-E mode, performance setting, 1 Hz) 4.8 mA @ 1.4 V (Super-E mode, power save setting, 1 Hz)
Backup Supply	1.4 V to 3.6 V

4 = Tracking, 2 concurrent GNSS

Support products

u-blox M8 Evaluation Kits:
Easy-to-use kits to get familiar with u-blox M8 positioning technology, evaluate functionality, and visualize GNSS performance.

EVK-M8230	u-blox M8 low power GNSS evaluation kit, supports UBX-M8230-CT chip

Product variants

UBX-M8230-CT	u-blox M8 low power concurrent GNSS chip, 47 pin WL-CSP

Further information

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

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