Product Summary
UBX-M8230-CT

Super low power u-blox M8 GNSS chip

Standard

Professional

Automotive
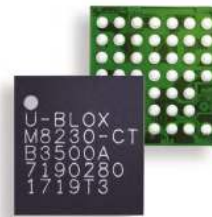
Ideal for portable applications thanks to Super-E mode

- 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 UBX-M8230-CT is an ultra low power GNSS chip optimized for wearable and portable applications. It features Super-E mode (Super-Efficient), providing a unique balance between power and performance. Compared with u-blox 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 features faster Time-to-First-Fix and ensures minimal power consumption.

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.

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.

	UBX-M8230-CT
Grade	
Automotive	
Professional	
Standard	•
GNSS	
GPS / QZSS	•
GLONASS	•
Galileo	cm
BeiDou	•
Number of concurrent GNSS	3
Interfaces	
UART	1
USB	
SPI	1
DDC (I²C compliant)	1
Features	
Data logging	S
Data batching	•
RTC crystal	S
Oscillator	T

cm = only supported in continuous mode
S = supported, may require ext. components
T = TCXO supported

UBX-M8230-CT

P

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: Aided start: Hot start:	 26 s 2 s 1 s

	Super-E mode (default)	Continuous mode
Sensitivity[2] Tracking & Nav: Reacquisition: Cold start: Hot start:	 –160 dBm –160 dBm –148 dBm –157 dBm	 –167 dBm –160 dBm –148 dBm –157 dBm
Max nav. update rate Single GNSS 2 Concurrent GNSS	 Up to 4 Hz Up to 4 Hz	 up to 18 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 (I²C 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.