Product summary

UBX-M10150-CC

u-blox M10 standard precision GNSS chip

Standard

Professional

Automotive

Ultra-low power GNSS receiver for wearables

- The smallest form factor; only 2.39 x 2.39 mm
- 8 mW in continuous tracking using LEAP technology
- Running, walking, cycling, and open water swimming modes
- > 99% accurate distance metering with integrated odometer

Small CSP33 pack
2.39 x 2.39 x 0.36

Product description

The UBX-M10150-CC is an ultra-low power GNSS chip, designed for integration into wearable applications including sports and smart watches, as well as other battery-powered devices with size constraints. The firmware is upgradeable and has been optimized to support a wide range of use cases and sporting activities. A u-blox Android driver with SUPL support facilitates integration.

The GNSS solution footprint is below 30 mm2, including required external components, thanks to the small 2.39 x 2.39 mm wafer-level chip package. Furthermore, the 0.36 mm z-height enables the creation of compact and slim product designs.

The LEAP technology offers low energy accurate positioning reaching 8 mW power consumption. It provides an optimal balance between low power consumption and position accuracy. Adaptation to signal conditions enables a reduction in power consumption of at least 50% while maintaining position accuracy. This can be achieved in a variety of signal environments, from urban to forest and open sky, with the use of compact wearable antennas.

The UBX-M10150-CC optimizes the overall system power consumption by excluding the need for any heavy signal processing on the application processor, while also allowing for automatic external LNA switching, which can additionally save up to 2 mW power. The application processor can be set to deep sleep mode, which allows navigation data to be stored internally (data batching).

The u-blox M10 utilizes proprietary multipath mitigation technology to leverage the most robust signals from the L1 band, ensuring enhanced position accuracy in challenging urban and weak signal environments.

u-blox modules are manufactured in IATF 16949-certified facilities and undergo comprehensive system-level testing. Qualification tests are conducted in accordance with the ISO 16750 standard, "Road vehicles – Environmental conditions and testing for electrical and electronic equipment".

	UBX-M10150-CC
Grade	
Automotive	
Professional	
Standard	•
GNSS	
GPS + QZSS/SBAS	•
GLONASS	
Galileo	•
BeiDou	•
Interfaces	
UART	1
SPI	1
DDC (I2C compliant)	1
Features	
LEAP	•
Firmware upgradable	•
Data batching	•
RTC crystal	S
Oscillator	T
Timepulse	1

S = supported, may require ext. components
T = TCXO supported

UBX-M10150-CC

Product performance

Receiver type	u-blox M10 engine GPS L1 C/A, QZSS L1 C/A/S, BeiDou B1I/B1C, Galileo E1B/C, SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN	
Nav. update rate	Up to 2 Hz (LEAP) Up to 12 Hz (High performance)	
Horizontal position accuracy[1]	1.5 m CEP	
Acquisition[1]	Cold start Aided start Hot start	28 s 1 s 1 s
Sensitivity[1]	Tracking & Nav. Reacquisition Cold start Hot start	−159 dBm −158 dBm −148 dBm −159 dBm

External components

Oscillator	TCXO
RTC input (optional)	32.768 kHz
Antenna supply & supervisor	External circuit required for short and open circuit detection
Flash memory (optional)	SPI interface

Tracking features

LEAP	Low energy accurate positioning reduces the power consumption retaining superior position accuracy
Data batching	Autonomous tracking up to 10 min at 1 Hz
Odometer	Measure traveled distance with support for different user profiles, with > 99% accuracy

Security features

Signal integrity	RF interference & jamming detection and reporting Spoofing detection and reporting
Device integrity	Receiver configuration lock by command
Secure interface	Signed UBX messages (SHA-256) JTAG debug interface disabled by default

Electrical data

Power consumption[2]	3 GNSS: 10 mW
Supply voltage	1.0 V to 1.8 V
Digital I/O voltage	1.8 V or 3.3 V
Backup supply	1.65 V to 3.6 V

1 = GPS/Galileo/BeiDou + SBAS/QZSS continuous tracking
2 = Supply voltage 1.0 V, digital I/O voltage 1.8 V

Package

33 pin WL-CSP: 2.39 x 2.39 x 0.36 mm

Environmental data, quality & reliability

Operating temp.	−20°C to +65°C
Storage temp.	−40 °C to +125 °C
MSL	1
Environmental grade	2015/863/EU RoHS-3, Green, IEC-61249-2-21 halogen-free
Environmental testing	JEDEC JESD47
Quality management	Manufactured and fully tested in IATF 16949 certified production sites

Interfaces

Serial interfaces	1 UART 1 DDC (I2C compliant) 1 SPI
Digital I/O	1 configurable time pulse 1 EXTINT interrupt input
Raw data output	Code phase data
Memory	SPI interface for optional Flash
Protocols	NMEA 4.11, UBX binary

Compatible u-blox location services

AssistNow	Real-time online A-GNSS service with assured global availability
CloudLocate	Extends the life of energy-constrained IoT applications.

Support products

EVK-M102	u-blox M10 GNSS evaluation kit with UBX-M10150-CC firmware upgradeable chip and TCXO
u-center 2	Highly intuitive software for GNSS performance evaluation

Product variants

UBX-M10150-CC	u-blox M10 GNSS chip, 33 pin CSP, GPS/GAL/Bei as default configuration

NOTE:

This document provides an objective specification overview of this product. Please refer to the data sheet for details on firmware-related performance and feature support.

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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