Product summary
UBX-M10050-KB

u-blox M10 standard precision GNSS chip

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Ultra-low-power GNSS receiver for high-performance asset-tracking applications

- Less than 15 mW power consumption without compromising GNSS performance
- Maximum position availability with concurrent reception of 4 GNSS
- Proven excellent performance, even with small antennas
- Advanced spoofing and jamming detection

Small QFN28 package
4.0 x 4.0 x 0.55 mm

Product description

The UBX-M10050-KB chip, which is part of the u-blox M10 standard precision GNSS platform, provides exceptional sensitivity and acquisition times for all L1 GNSS systems.

The extremely low power consumption of <15 mW in continuous tracking mode allows great power autonomy for all battery-operated devices, such as asset trackers, without compromising on GNSS performance.

UBX-M10050-KB supports concurrent reception of four GNSS (GPS, GLONASS, Galileo, and BeiDou). The high number of visible satellites enables the receiver to select the best signals. This maximizes the position availability, in particular under challenging conditions such as in deep urban canyons.

u-blox Super-S (Super-Signal) technology offers great RF sensitivity and can improve the dynamic position accuracy by up to 25% with small antennas or in a non-line-of-sight scenario.

UBX-M10050-KB detects jamming and spoofing events and reports them to the host, so that the system can react to such events. Advanced filtering algorithms mitigate the impact of RF interference and jamming, thus enabling the product to operate as intended.

UBX-M10050-KB chips are qualified by applying AEC-Q100 stress conditions and are manufactured in IATF 16949 certified sites.

	UBX-M10050-KB
Grade	
Automotive	
Professional	•
Standard	
GNSS	
GPS + QZSS/SBAS	•
GLONASS	•
Galileo	•
BeiDou	•
Number of concurrent GNSS	4
Interfaces	
UART	1
SPI	1
DDC (I2C compliant)	1
Features	
RTC crystal	S
Oscillator	C/T
Antenna supervisor	S
Timepulse	1

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

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UBX-M10050-KB

Product performance

Receiver type	u-blox M10 engine GPS L1 C/A, QZSS L1 C/A/S, GLONASS L10F, BeiDou B1I/B1C, Galileo E1B/C, SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN	
Nav. update rate	Up to 25 Hz (single GNSS) Up to 10 Hz (4 concurrent GNSS)	
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	–167 dBm –160 dBm –148 dBm –159 dBm

External components

Oscillator	Crystal or TCXO
RTC input (optional)	32.768 kHz
Antenna supply & supervisor	External circuit required for short and open circuit detection
Flash memory (optional)	SPI interface (cannot be used to upgrade firmware)

Tracking features

u-blox Super-S	Improved accuracy with small antennas
Data batching	Autonomous tracking up to 10 min at 1 Hz
Odometer	Measure traveled distance with support for different user profiles
Protection level	Real-time position accuracy estimate with 95% confidence

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

Tracking mode	Continuous (PSM [2])
Power consumption [3]	2 GNSS: 15 mW (7.5 mW) 3 GNSS: 18 mW (9 mW) 4 GNSS: 21 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 + SBAS/QZSS continuous tracking
2 = Power save mode, 1 Hz cyclic tracking
3 = Supply voltage 1.0 V, digital I/O voltage 1.8 V

Package

28 pin QFN: 4.0 x 4.0 x 0.55 mm

Environmental data, quality & reliability

Operating temp.	–40°C to +85°C
Storage temp.	–40 °C to +125 °C
MSL	3
Environmental grade	2015/863/EU RoHS-3, Green, IEC-61249-2-21 halogen-free
Environmental testing	AEC-Q100
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-M101	u-blox M10 GNSS evaluation kit with UBX-M10050-KB chip and TCXO
EVK-M101C	u-blox M10 GNSS evaluation kit with UBX-M10050-KB chip and crystal oscillator
u-center 2	Highly intuitive software for GNSS performance evaluation

Product variants

UBX-M10050-KB -A0100A	u-blox M10 GNSS chip, 28 pin QFN, GPS/GAL as default configuration
UBX-M10050-KB -A0103A	u-blox M10 GNSS chip, 28 pin QFN, GPS/GAL/BDS 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-u-blox**.

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