

MAX-M8Q-01A module



Automotive grade u-blox M8 GNSS module



The smallest automotive grade GNSS module with extended operating temperature

- Easy migration from professional grade MAX design
- Superior position accuracy in urban canyons
- Operating temperature range of -40 °C to +105 °C
- Zero PPM program and full traceability
- Advanced jamming and spoofing detection
- Over 12 years of automotive experience



9.7 × 10.1 × 2.5 mm

Product description

The MAX-M8Q-01A module is built on the exceptional performance of the u-blox M8 GNSS engine and is targeted for use in hazardous environments such as automotive applications. It is the smallest automotive grade GNSS module on the market that offers an extended operational temperature range from -40 °C to +105 °C.

The module is based on the industry-proven MAX form factor, which enables easy migration from previous professional grade MAX generations to the latest u-blox M8 automotive grade MAX-M8Q-01A module.

The MAX-M8Q-01A module utilizes concurrent reception of up to three GNSS systems (GPS/Galileo together with BeiDou or GLONASS) for more reliable and accurate positioning, especially under poor GNSS signal conditions.

MAX-M8Q-01A combines a high level of integration capability with flexible connectivity options in a miniature package. The

DDC (I²C compliant) interface provides connectivity and enables synergies with most u-blox cellular modules.

As security and integrity is vital for many automotive applications, the MAX-M8Q-01A automotive grade module offers sophisticated message integrity protection, signature capabilities, and spoofing detection. It is the right choice for high protection against malicious positioning interference.

The MAX-M8Q-01A uses a GNSS chip qualified according to AEC-Q100. The modules are manufactured in ISO/TS 16949 certified sites and fully tested on a system level.

Qualification tests are performed as stipulated in the ISO 16750 standard: "Road vehicles – Environmental conditions and testing for electrical and electronic equipment". The MAX-M8Q-01A automotive grade module adheres to automotive industry standard quality specifications and production flow.

Product selector

Model	Category	GNSS	Supply	Interfaces	Features	Grade	
	Standard Precision GNSS High Precision GNSS Dead Reckoning Timing	GPS/QZSS GLONASS Galileo BeiDou	Number of concurrent GNSS	2.7 V – 3.6 V	UART USB SPI DDC (I ² C compliant)	Programmable (Flash) Data logging Additional SAW Additional LNA RTC crystal Oscillator Built-in antenna Built-in antenna supply and supervisor Timepulse	Standard Professional Automotive
MAX-M8Q-01A*	•	• • • •	3	•	• T	1	•

* = Operating temperature -40 °C to +105 °C / T = TCXO

MAX-M8Q-01A module



Features

Receiver type	72-channel u-blox M8 engine GPS/QZSS L1 C/A, GLONASS L1OF, BeiDou B1I, Galileo E1B/C SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN	
Nav. update rate	Single GNSS:	up to 18 Hz
	2 Concurrent GNSS:	up to 10 Hz
Position accuracy	Autonomous	2.5 m CEP
Acquisition ¹		
Cold starts:	26 s	
Aided starts:	2 s	
Reacquisition:	1 s	
Sensitivity ¹		
Tracking:	-167 dBm	
Cold starts:	-148 dBm	
Hot starts:	-157 dBm	
Assistance GNSS	AssistNow Online AssistNow Offline (up to 35 days) AssistNow Autonomous (GPS only, up to 3 days) OMA SUPL & 3GPP compliant	
Oscillator	TCXO	
RTC crystal	Built-in	
Anti jamming	Active CW detection and removal	
Memory	Onboard ROM	
Supported antennas	Active and passive	
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	

1 For default mode: GPS/SBAS/QZSS+GLONASS

Electrical data

Power supply	2.7 V to 3.6 V
Digital I/O voltage level	1.65 V to 3.6 V
Power Consumption ²	23 mA @ 3 V (Continuous) 6.2 mA @ 3 V (Power Save mode, 1 Hz)
Backup Supply	1.4 V to 3.6 V

2 For default mode: GPS/SBAS/QZSS+GLONASS

Package

18 pin LCC (Leadless Chip Carrier): 9.7 x 10.1 x 2.5 mm, 0.6 g

Environmental data, quality & reliability

Operating temp.	-40 °C to +105 °C
RoHS compliant (lead-free)	
Green (halogen-free):	MAX-M8Q
Qualification according to ISO 16750	
Manufactured in ISO/TS 16949 certified production sites	
Uses u-blox M8 chips qualified according to AEC-Q100	

Interfaces

Serial interfaces	1 UART 1 DDC (I ² C compliant)
Digital I/O	Configurable timepulse 1 EXTINT input for wake-up
Timepulse	Configurable: 0.25 Hz to 10 MHz
Protocols	NMEA, UBX binary, RTCM

Support products

u-blox M8 Evaluation Kits:

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

EVK-M8N² u-blox M8 GNSS Evaluation Kit, with TCXO, supports MAX-M8Q-01A

2 The EVK supports a temperature range of -40 °C to +65 °C

Product variants

MAX-M8Q-01A u-blox M8 concurrent GNSS LCC module, TCXO, ROM, Automotive Grade

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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