

# MAX-M8 series

Standard Professional Automotive

POSITIONING

## u-blox M8 concurrent GNSS modules

### Highlights

- Miniature LCC package
- Concurrent reception of GPS/QZSS, GLONASS, BeiDou
- Industry leading -167 dBm navigation sensitivity
- Product variants to meet performance and cost requirements
- Pin-to-pin and software compatible with MAX-7 and MAX-6



MAX-M8 series:  
9.7 x 10.1 x 2.5 mm

### Product description

The MAX-M8 series of standalone concurrent GNSS modules is built on the exceptional performance of the u-blox M8 engine in the industry proven MAX form factor. With dual-frequency RF front-end, the u-blox M8 concurrent GNSS engine is able to intelligently use the highest amount of visible satellites from two GNSS (GPS, GLONASS and BeiDou) systems for more reliable positioning. The MAX-M8 series is ideal for performance driven applications.

The MAX-M8 series provides high sensitivity and minimal acquisition times while maintaining low system power. The MAX-M8C is optimized for cost sensitive applications and has the lowest power consumption, the MAX-M8Q provides best performance for passive and active antennas designs, while the MAX-M8W is optimized for active antennas with best performance. The industry-proven MAX form factor allows easy migration from previous MAX generations. Sophisticated

RF-architecture and interference suppression ensure maximum performance even in GNSS-hostile environments.

The MAX-M8 combines a high level of integration capability with flexible connectivity options in a miniature package. This makes MAX-M8 perfectly suited for industrial applications with strict size and cost requirements. The MAX-M8Q is also halogen free (green) which makes it also a perfect solution for consumer applications. The DDC (I<sup>2</sup>C compliant) interface provides connectivity and enables synergies with most u-blox cellular modules.

u-blox M8 modules use GNSS chips qualified according to AEC-Q100, are manufactured in ISO/TS 16949 certified sites, and fully tested on a system level. Qualification tests are performed as stipulated in the ISO16750 standard: "Road vehicles – Environmental conditions and testing for electrical and electronic equipment".

### Product selector

Model	Type	Supply	Interfaces	Features	Grade
	GPS / QZSS GLONASS Galileo BeiDou Timing Dead Reckoning Precise Point Positioning Raw Data	1.65 V – 3.6 V 2.7 V – 3.6 V Lowest power (DC/DC)	UART USB SPI DDC (I <sup>2</sup> C compliant)	Programmable (Flash) Data logging Additional SAW Additional LNA RTC crystal Internal oscillator Active antenna / LNA supply Active antenna / LNA control Antenna short circuit detection / protection pin Antenna open circuit detection pin Frequency output	Standard Professional Automotive
MAX-M8C	• • •	• •	• •	◆ C ○ • •	Standard
MAX-M8Q	• • •	• •	• •	• T ○ • •	Professional
MAX-M8W	• • •	• •	• •	• T • • •	Automotive

○ = Optional, not activated per default or requires external components

◆ = Higher backup current

C = Crystal / T = TCXO

## Features

Receiver type	72-channel u-blox M8 concurrent GNSS receiver GPS/QZSS L1 C/A, GLONASS L10F, BeiDou B1, SBAS L1 C/A: WAAS, EGNOS, MSAS		
Nav. update rate	Single GNSS:	up to 18 Hz	
	Concurrent GNSS:	up to 10 Hz	
Position accuracy	2.0 m CEP		
		MAX-M8Q/W	MAX-M8C
Acquisition <sup>1</sup>	Cold starts:	26 s	27 s
	Aided starts:	2 s	4 s
	Reacquisition:	1 s	1 s
Sensitivity <sup>1</sup>	Tracking & Nav:	-167 dBm	-164 dBm
	Cold starts:	-148 dBm	-147 dBm
	Hot starts:	-156 dBm	-156 dBm
Assistance GNSS	AssistNow Online AssistNow Offline (up to 35 days) AssistNow Autonomous (up to 6 days) OMA SUPL & 3GPP compliant		
Oscillator	TCXO (MAX-M8Q/M8W), Crystal (MAX-M8C)		
RTC crystal	Built-In (MAX-M8Q/M8W) or cost efficient solution with higher Backup current (MAX-M8C)		
Noise figure	On-chip LNA		
Anti jamming	Active CW detection and removal		
Memory	Onboard ROM		
Supported antennas	Active and passive		
Odometer	Travelled distance		

<sup>1</sup> For default mode: GPS/SBAS/QZSS+GLONASS

## Electrical data

Supply voltage	1.65 V to 3.6 V (MAX-M8C) 2.7 V to 3.6 V (MAX-M8Q/M8W)
Power consumption <sup>2</sup>	25 mA @ 3.0 V (continuous) 5.5 mA @ 3.0 V Power Save Mode (1 Hz, GPS only)
Backup supply	1.4 to 3.6 V

<sup>2</sup> MAX-M8C

## Interfaces

Serial interfaces	1 UART 1 DDC (I <sup>2</sup> C compliant)
Digital I/O	Configurable timepulse 1 EXTINT input for Wakeup
Timepulse	Configurable 0.25 Hz to 10 MHz
Protocols	NMEA, UBX binary, RTCM

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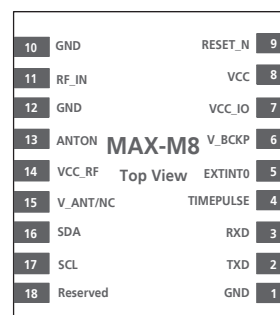
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## Package

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

Pinout



## Environmental data, quality & reliability

Operating temp.	-40° C to 85° C
Storage temp.	-40° C to 85° C (MAX-M8Q/M8W) -40° C to 105° C (MAX-M8C)

RoHS compliant (lead-free)

Green (halogen-free): MAX-M8Q

Qualification according to ISO 16750

Manufactured and fully tested in ISO/TS 16949 certified production sites

Uses u-blox M8 chips qualified according to AEC-Q100

## 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-M8N: u-blox M8 GNSS evaluation kit,  
with TCXO, supports MAX-M8Q/M8W

EVK-M8C: u-blox M8 GNSS evaluation kit,  
with crystal, supports MAX-M8C

## Ordering information

See datasheet

## Contact us

For contact information, see [www.u-blox.com/contact-us](http://www.u-blox.com/contact-us).