

MAX-7 series

u-blox 7 GNSS modules

Standard Professional Automotive

POSITIONING

Highlights

- Miniature LCC package
- GNSS engine for GPS/QZSS, GLONASS
- Low power consumption
- Product variants to meet performance and cost requirements
- Pin-to-pin and software compatible with MAX-M8 and MAX-6



MAX-7 series:
9.7 x 10.1 x 2.5 mm

Product description

The MAX-7 series of standalone GNSS modules is built on the exceptional performance of the u-blox 7 multi-GNSS (GPS, GLONASS, QZSS and SBAS) engine. The MAX-7 series delivers high sensitivity and minimal acquisition times in the ultra compact MAX form factor.

The MAX-7 series provides maximum sensitivity while maintaining low system power. The MAX-7C is optimized for cost sensitive applications. The MAX-7Q provides best performance and lowest power, while the MAX-7W provides best performance and is optimized for active antennas. The industry proven MAX form factor allows easy migration from MAX-6 modules. Sophisticated RF-architecture and interference suppression ensure maximum performance even in GNSS-hostile environments.

The MAX-7 series combines a high level of integration capability with flexible connectivity options in a miniature package. This makes it perfectly suited for industrial and mass-market end products with strict size and cost requirements. The DDC (I²C compliant) interface provides connectivity and enables synergies with u-blox cellular modules.

u-blox 7 modules use GNSS chips qualified according to AEC-Q100 and are manufactured in ISO/TS 16949 certified sites. Qualification tests are performed as stipulated in the ISO16750 standard: "Road vehicles – Environmental conditions and testing for electrical and electronic equipment". MAX-7Q complies with green/halogen free standards.

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 ² 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-7C	• •	• •	• •	◆ C ○ • •	
MAX-7Q	• •	• •	• •	• T ○ • •	
MAX-7W	• •	• •	• •	• T • • •	

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

◆ = Higher backup current

C = Crystal / T = TCXO

Features

Receiver type	56-channel u-blox 7 engine GPS/QZSS L1 C/A, GLONASS L1 FDMA, SBAS: WAAS, EGNOS, MSAS		
Navigation update rate	up to 10 Hz		
Accuracy		GPS	GLONASS
	Position	2.5 m CEP	4.0 m
Acquisition ¹	SBAS	2.0 m CEP	n.a.
	Cold starts:	29 s	30 s
	Aided starts:	5 s	n.a.
Sensitivity ¹	Reacquisition:	1 s	1 s
	Tracking:	-161 dBm	-158 dBm
	Cold starts:	-148 dBm	-140 dBm
Assistance GPS	Warm starts:	-148 dBm	-145 dBm
	AssistNow Online		
	AssistNow Offline		
Oscillator	AssistNow Autonomous		
	OMA SUPL & 3GPP compliant		
	TCXO (MAX-7Q/7W), crystal (MAX-7C)		
RTC crystal	Built-In (MAX-7Q/7W) or cost efficient solution with higher Backup current (MAX-7C)		
Anti jamming	Active CW detection and removal		
Memory	Onboard ROM		
Supported antennas	Active and passive		

¹ MAX-7Q/W

Electrical data

Supply voltage	1.65 V to 3.6 V (MAX-7C) 2.7 to 3.6 V (MAX-7Q/7W)
Digital I/O voltage level	1.65 – 3.6 V
Power Consumption	16.5 mA @ 3 V (Continuous) ² 4.5 mA @ 3 V Power Save mode (1 Hz) ²
Backup Supply	1.4 to 3.6 V

² MAX-7C

Interfaces

Serial interfaces	1 UART 1 DDC (I ² 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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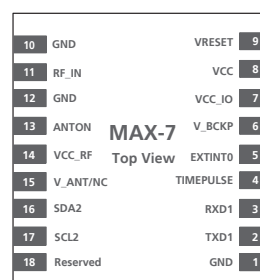
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Package

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

Pinout



Environmental data, quality & reliability

Operating temp.	-40° C to 85° C
Storage temp.	-40° C to 85° C
RoHS compliant (lead-free)	
Green (halogen-free):	MAX-7Q
Qualification according to ISO 16750	
Manufactured in ISO/TS 16949 certified production sites	
Uses u-blox 7 chips qualified according to AEC-Q100	

Support products

u-blox 7 Evaluation Kits:

Easy-to-use kits to get familiar with u-blox 7 positioning technology, evaluate functionality, and visualize GNSS performance.

EVK-7N:	u-blox 7 GNSS Evaluation Kit, with TCXO, supports MAX-7Q, MAX-7W
EVK-7C:	u-blox 7 GNSS Evaluation Kit, with Crystal, supports MAX-7C

Product variants

MAX-7C	u-blox 7 GNSS LCC Module, crystal, ROM
MAX-7Q	u-blox 7 GNSS LCC Module, TCXO, ROM
MAX-7W	u-blox 7 GNSS LCC Module, TCXO, ROM, short-circuit protection

Further information

For contact information, see www.u-blox.com/contact-us.

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