MAX-7 series
u-blox 7 GNSS modules

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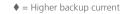
The MAX-7 series combines a high level of integration capability with flexible connectivity options in a miniature package. This makes it perfectly suited for industrial and mass-market end products with strict size and cost requirements. The DDC (I²C compliant) interface provides connectivity and enables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

		GPS	GLONASS
Accuracy	Position	2.5 m CEP	4.0 m
	SBAS	2.0 m CEP	n.a.
Acquisition[1]	Cold starts:	29 s	30 s
	Aided starts:	5 s	n.a.
	Reacquisition:	1 s	1 s
Sensitivity[1]	Tracking:	–161 dBm	–158 dBm
	Cold starts:	–148 dBm	–140 dBm
	Warm starts:	–148 dBm	–145 dBm

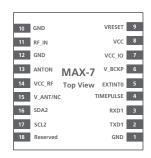| Assistance GPS	AssistNow Online AssistNow Offline AssistNow Autonomous OMA SUPL & 3GPP compliant
Oscillator	TCXO (MAX-7Q/7W), crystal (MAX-7C)
RTC crystal	Built-In (MAX-7Q/7W) or cost efficient solution with higher Backup current (MAX-7C)
Anti jamming	Active CW detection and removal
Memory	Onboard 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 (I²C compliant)
Digital I/O	Configurable timepulse 1 EXTINT input for Wakeup
Timepulse	Configurable: 0.25 Hz to 10 MHz
Protocols	NMEA, UBX binary, RTCM

Package

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

Pinout

Pin	Name		Name	Pin
10	GND		VRESET	9
11	RF_IN		VCC	8
12	GND		VCC_IO	7
13	ANTON	MAX-7	V_BCKP	6
14	VCC_RF	Top View	EXTINT0	5
15	V_ANT/NC		TIMEPULSE	4
16	SDA2		RXD1	3
17	SCL2		TXD1	2
18	Reserved		GND	1

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.