ZOE-M8G

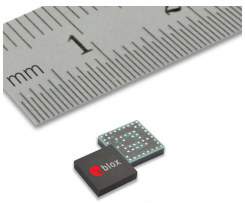
Standard | Professional | Automotive

POSITIONING

Ultra small multi-GNSS module with superior performance

Highlights

- Fully integrated and complete solution, reducing total design efforts
- Ideal for passive antennas, due to built-in SAW and LNA
- High accuracy thanks to concurrent reception of up to 3 GNSS
- Industry leading –167 dBm navigation sensitivity



ZOE-M8G
4.5 x 4.5 x 1.0 mm

Product description

The ZOE-M8G is u-blox's latest, highly integrated System in Package (SiP) GNSS module based on high performing u-blox M8 concurrent positioning engine. A new, record breaking ultra miniature form factor integrates a complete GNSS receiver including SAW filter, LNA and TCXO.

The ZOE-M8G module is mainly targeted for applications that require a small size without compromising the performance. For RF optimization, the ZOE-M8G integrates a front-end SAW filter and an additional front-end LNA for increased jamming immunity and easier antenna integration. A passive antenna can be used to provide a highly integrated system solution with minimal eBOM.

Incorporating ZOE-M8G into customer designs is simple and straightforward thanks to the fully integrated design, single voltage supply, low power consumption, simple interface and sophisticated interference suppression that ensure maximum performance even in GNSS-hostile environments.

With its dual-frequency RF front-end, the ZOE-M8G is able to utilize concurrent reception of up to three GNSS systems (GPS/Galileo together with BeiDou or GLONASS). In addition, the ZOE-M8G provides SQI interface for optional external Flash, allowing future firmware upgrade and improved A-GNSS performance.

Thanks to u-blox advanced power save modes, dedicated algorithms and complete GNSS solution, ZOE-M8G meets even the most stringent requirements in versatile industrial and consumer applications, such as UAVs, wearables and asset tracking. It also supports message integrity protection, anti-jamming, and anti-spoofing, providing reliable positioning in difficult environmental conditions as well as in security attack scenarios.

The ZOE-M8G can be easily integrated in manufacturing thanks to the advanced S-LGA (Soldered Land Grid Array) packaging technology, which enables easier and more reliable soldering processes compared to a normal LGA (Land Grid Array) package.

The ZOE-M8G SiP module is fully tested and qualified according to JESD47 / ISO 16750 standard.

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	1.8 V	UART	USB	SPI	DDC (I²C 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
ZOE-M8G	•				•	•	•	•	3	•	•		•	•	E	E	•	•	o	T			1			

E = External Flash required
o = Optional, or requires external components

C = Crystal / T = TCXO

Features

Receiver type	72-channel u-blox M8 engine GPS/QZSS L1 C/A, GLONASS L10F BeiDou B1I, Galileo E1B/C SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN
Max nav. update rate[1]	Single GNSS: up to 18 Hz 2 Concurrent GNSS: up to 10 Hz
Accuracy[2]	2.0 m CEP
Acquisition[2]	Cold starts: 26 s Aided starts: 2 s Reacquisition: 1 s
Sensitivity[2]	Tracking & Nav: –167 dBm Cold starts: –148 dBm Hot starts: –157 dBm
Assistance GNSS	AssistNow GNSS Online AssistNow GNSS Offline (up to 35 days) AssistNow Autonomous (up to 6 days) OMA SUPL & 3GPP compliant
Oscillator	TCXO
RTC crystal	Optional, can be derived from external crystal or RTC Clock
Anti jamming	Active CW detection and removal. Extra onboard SAW band pass filter
Memory	ROM
SQI Flash (optional) for	FW update AssistNow Offline, AssistNow Autonomous Data logging
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
Data-logger[3]	For position, velocity, time, and odometer data

Electrical data

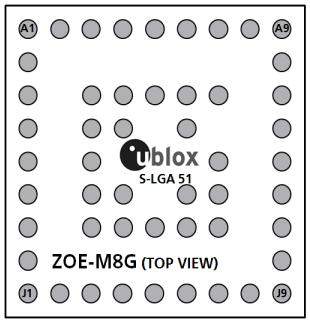
Supply voltage	1.71 V to 1.89 V
Digital I/O voltage level	1.71 V to 1.89 V
Power consumption[2]	40 mA @ 1.8 V (Continuous) 12.4 mA @ 1.8 V (Power Save Mode, 1 Hz)
Backup Supply	1.4 to 3.6 V

1 ROM
2 For default mode: GPS/SBAS/QZSS+GLONASS
3 External Flash required

Package

51 pin S-LGA (Soldered Land Grid Array): 4.5 x 4.5 x 1.0 mm, 0.04 g

Pinout



Environmental data, quality & reliability

Operating temp. –40° C to 85° C

RoHS compliant (lead-free)

Qualification according to standard JESD47 / ISO 16750

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

Moisture sensitivity level 3

Interfaces

Serial interfaces	1 UART 1 SPI (optional) 1 DDC (I^2C compliant) 1 SQI interface (for optional Flash)
Digital I/O	Configurable timepulse 1 EXTINT input
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 M8 positioning technology, evaluate functionality, and visualize GNSS performance.

EVK-M8GZOE	u-blox M8 Concurrent GNSS Evaluation Kit, supports ZOE-M8G

Product variants

ZOE-M8G	u-blox M8 concurrent GNSS module, S-LGA, TCXO, ROM, SAW, LNA

Further information

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

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