Product Summary

ZOE-M8B SiP

Ultra small, super low power u-blox M8 GNSS SiP

Standard

Professional

Automotive

Ultra small, ultra low power GNSS SiP with Super-E mode

- Ultra small size SiP (System-in-Package) 4.5 x 4.5 x 1.0 mm
- Fully integrated and complete solution, reducing total design efforts
- As low as 12 mW power consumption thanks to Super-E mode
- Ideal for passive antenna, due to built-in SAW and LNA
- High accuracy thanks to concurrent reception of up to 3 GNSS
- Pin-to-pin compatible with ZOE-M8G

4.5 × 4.5 × 1.0 mm

Product description

ZOE-M8B is u-blox's ultra small, highly integrated GNSS SiP (System in Package), measuring just 4.5 x 4.5 x 1.0 mm.

Making use of the Super-Efficient (Super-E) mode, ZOE-M8B offers an ideal balance between miniature size, low power consumption and good GNSS performance. ZOE-M8B uses up to 2.5 times less power than its pin-to-pin compatible counterpart, ZOE-M8G (running in 1 Hz full power mode), while still maintaining good positioning and speed accuracy. An average power consumption over a typical 30-minute track will be as low as 25 mW. This is true even when using an industrial antenna design with moderate-to-low signal levels. Super-E has a default performance setting for the best balance between power vs. performance. It also has a power save setting for additional power savings with potential compromise on performance.

The TCXO-based ZOE-M8B 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-M8B into customer designs is simple and straightforward thanks to the fully integrated design, single 1.8 V voltage supply, simple interface, and sophisticated interference suppression, which ensures maximum performance even in GNSS-hostile environments. In addition, the ZOE-M8B provides an SQI interface for optional external flash, continuous data logging, and improved A-GNSS performance.

ZOE-M8B is based on the high performance u-blox M8 concurrent GNSS engine, which supports GPS / GLONASS / BeiDou / GalileoC, including message integrity protection, anti-jamming, and anti-spoofing. All of these features together provide reliable positioning in difficult environmental conditions, as well as in security attack scenarios.

The ZOE-M8B SiP 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. It is fully tested and qualified according to the JESD47 / ISO 16750 standard.

	ZOE-M8B
Grade	
Automotive	
Professional	•
Standard	
GNSS	
GPS / QZSS	•
GLONASS	•
Galileo	cm
BeiDou	•
Number of concurrent GNSS	3
Interfaces	
UART	1
USB	
SPI	1
DDC (I^2C compliant)	1
Features	
Data logging	E
Data batching	•
Additional SAW	•
Additional LNA	•
RTC crystal	o
Oscillator	T
Power supply	
1.71 V – 1.89 V	•

E = External Flash Required
T = TCXO
cm = only supported in continuous mode
o = Optional, or requires external components

ZOE-M8B SiP

Features

Receiver type	72-channel u-blox M8 engine GPS/QZSS L1 C/A, GLONASS L10F BeiDou B1I, Galileo E1B/C[1] SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN	
	Super-E mode (default)	Continuous mode
Max nav. update rate Single GNSS 2 Concurrent GNSS	 up to 4 Hz up to 4 Hz	 up to 18 Hz up to 10 Hz
Accuracy	3.5 m CEP	2.5 m CEP
Sensitivity Tracking & Nav: Cold starts: Hot starts:	 –160 dBm[2] –148 dBm –157 dBm	 –167 dBm –148 dBm –157 dBm
Acquisition	Cold starts: 26 s Aided starts: 2 s Reacquisition: 1 s	
Assistance GNSS	AssistNow Online AssistNow Offline (up to 35 days) AssistNow Autonomous (GPS only, up to 6 days) OMA SUPL & 3GPP compliant	
Oscillator	TCXO	
RTC crystal	Can be derived from external RTC clock	
Super-E mode	Super Efficient mode for lowest power	
Anti jamming	Active CW detection and removal. Extra onboard SAW band pass filter	
Memory	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	
Data logging[3] and data batching	For position, velocity, time, and odometer data	

1 = Galileo only supported in continuous mode
2 = Switch to continuous mode with very weak signals
3 = External flash required

Interfaces

Serial interfaces	1 UART 1 SPI (optional) 1 DDC (I^2C compliant) 1 SQI interface (for optional flash)
Digital I/O	1 EXTINT input
Protocols	NMEA, UBX binary, RTCM

Package

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

Environmental data, quality & reliability

Operating temp.	–40 °C to +85 °C
RoHS compliant (lead-free)	
Qualification according to standard JESD47 / ISO 16750	
Moisture sensitivity level 3	

Electrical data

Supply voltage	1.71 V to 1.89 V
Power consumption[4]	40 mA @ 1.8 V (Continuous mode, 1 Hz) 8.3 mA @ 1.8 V (Super-E mode, performance setting, 1 Hz) 6.8 mA @ 1.8 V (Super-E mode, power save setting, 1 Hz)
Backup Supply	1.4 V to 3.6 V

4 = Tracking, 2 concurrent GNSS

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-M8BZOE	u-blox M8 Low Power GNSS Evaluation Kit, supports ZOE-M8B

Product variants

ZOE-M8B	u-blox M8 low power GNSS SiP, 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.

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