

NEO/LEA-M8T

Standard Professional Automotive

u-blox M8 concurrent GNSS timing modules

Highlights

- Concurrent reception of GPS/QZSS, GLONASS, BeiDou
- Market leading acquisition and tracking sensitivity
- Optimized accuracy and availability with Survey-in and single-satellite timing
- Minimized power consumption with low duty-cycle operation
- Maximized reliability with integrity monitoring and alarms
- Multi-GNSS raw data, IMES message data
- Backward compatible with LEA-5T, LEA-6T and NEO-6T



NEO-M8T:
12.2 x 16.0 x 2.4 mm



LEA-M8T:
17.0 x 22.4 x 2.4 mm

Product description

The NEO-M8T and LEA-M8T concurrent GNSS modules deliver high integrity, precision timing in demanding applications world-wide. Support for BeiDou and GLONASS constellations enables compliance with national requirements. Enhanced sensitivity and concurrent dual-constellation reception extend coverage and integrity to challenging signal environments. Survey-in and fixed-position navigation reduce timing jitter, even at low signal levels, and enable synchronization to be maintained with as few as one single satellite in view. Support for low duty cycle operation reduces power consumption for battery-powered applications.

u-blox timing products include timing integrity measures with Receiver Autonomous Integrity Monitoring (RAIM) and continuous phase uncertainty estimation. They feature high dynamic range radios with both analog and digital interference mitigation, supporting applications in wireless communications equipment.

The M8T timing modules are delivered in u-blox' established LEA and NEO form-factors with standard pin-out, allowing ready migration from previous product generations.

u-blox timing products can make use of u-blox AssistNow or industry standard aiding data. This reduces the time to first fix and delivers exceptional acquisition sensitivity, even on first installation before precise location, time or frequency are known.

u-blox M8 modules use GNSS chips qualified according to AEC-Q100, are manufactured in ISO/TS 16949 certified sites, and are 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 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 |
| NEO-M8T | • • R • • • • | • • | • • • • | • • • • • T ○ ○ | Professional |
| LEA-M8T | • • R • • • • | • • | • • • • | • • • • T • • • ○ | Automotive |

○ = Optional, not activated per default or requires external components
C = Crystal / T = TCXO

R = Galileo ready

Features - GNSS

| | | |
|--------------------|--|-------------------------|
| Receiver type | 72-channel u-blox M8 engine GPS/QZSS L1 C/A, GLONASS L10F, BeiDou B1 SBAS L1 C/A: WAAS, EGNOS, MSAS Galileo-ready E1B/C (subject to Firmware upgrade) | |
| Nav. update rate | Concurrent GNSS: up to 2 Hz | |
| Position accuracy | 2.5 m CEP (Autonomous) | |
| Acquisition | GPS & GLONASS | GPS & BeiDou |
| | Cold starts: 26 s | 27 s |
| | Aided cold starts: 2 s | 3 s |
| Sensitivity | Tracking & Nav: -167 dBm | -165 dBm |
| | Cold starts (aided): -157 dBm | -151 dBm |
| | (autonomous): -148 dBm | -148 dBm |
| | Reacquisition: -160 dBm | -160 dBm |
| Assistance | AssistNow GNSS Online AssistNow GNSS Offline (up to 35 days) AssistNow Autonomous (up to 6 days) OMA SUPL & 3GPP compliant | |
| Oscillator | TCXO | |
| RTC crystal | Built-In | |
| Noise figure | On-chip LNA (LEA-M8T) Extra LNA for passive antenna (NEO-M8T) | |
| Anti jamming | Active CW detection and removal. On-board SAW band pass filter | |
| Memory | Internal SQI Flash for Firmware update | |
| Supported antennas | Active and passive | |

Features - Timing

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|----------------------|--|
| Timing accuracy | Clear sky: ≤ 20 ns |
| Time-pulse frequency | 0.25 Hz – 10 MHz |
| Time-pulse jitter | ±11 ns |
| Time-mark resolution | 21 ns |
| Integrity reports | RAIM active, phase uncertainty time-pulse rate/duty-cycle |

Environmental data, quality & reliability

| | |
|--|-----------------|
| Operating temp. | -40° C to 85° C |
| Storage temp. | -40° C to 85° C |
| RoHS compliant (lead-free) | |
| 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 | |

Electrical data

| | |
|-------------------|---|
| Supply voltage | 2.7 V to 3.6 V |
| Power consumption | 15 µA (Battery backup) 50 µA (Software backup) 34 mA @ 3.0 V (Operational, NEO-M8T) 30 mA @ 3.0 V (Operational, LEA-M8T) |
| Backup Supply | 1.4 to 3.6 V |

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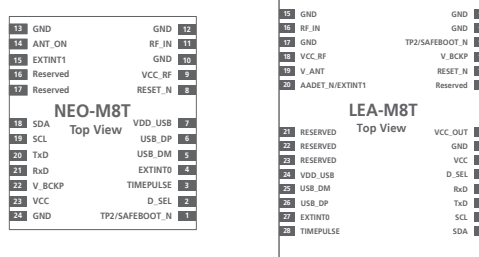
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Package

NEO-M8T: 24 pin LCC (Leadless Chip Carrier): 12.2 x 16.0 x 2.4 mm, 1.6 g
LEO-M8T: 28 pin LCC (Leadless Chip Carrier): 17.0 x 22.4 x 2.4 mm, 2.6 g
Pinouts



Features - Raw data and IMES

| | |
|------------------|---|
| Measurement data | GPS, GLONASS, BeiDou, SBAS and QZSS (Carrier phase; Code phase & pseudo-range; Doppler) |
| Message data | GPS, GLONASS, BeiDou, SBAS, QZSS L1S and IMES beacons (50/250 bps auto-baud) |

Features - Power management

| | |
|--|--|
| Power-save modes | On/off low duty-cycle |
| Off control | Hardware, message interface |
| On control | Hardware, wake-on UART activity, Timer (using low power RTC) |
| Automatic on/off with configurable period (GPS-only) | |

Features - Antenna management

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|---------|---|
| NEO-M8T | External with logic-level antenna switching output, filtered continuous supply. |
| LEA-M8T | Internal antenna bias supply with switching, over-current protection and alarm. Optional input for external open-circuit detection. |

Interfaces

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|--------------------|---|
| Serial interfaces | SPI or UART and DDC (I ² C compliant) USB V2.0 full speed 12 Mbit/s |
| Protocols | NMEA, UBX binary, RTCM |
| Time-pulse outputs | 2 |
| Time-mark inputs | 2 |

Support products

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|----------|--------------------------------------|
| EVK-M8T: | u-blox M8 Timing GNSS Evaluation Kit |
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Product variants

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|---------|---|
| NEO-M8T | u-blox M8 GNSS LCC module in NEO form factor, Timing, TCXO, flash, SAW, LNA |
| LEA-M8T | u-blox M8 GNSS LCC module in LEA form factor, Timing, TCXO, flash, SAW |

Further information

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

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