Product Summary

NEO-M8 series

Versatile u-blox M8 GNSS modules

Versatile GNSS modules in different variants for easy manufacturing
- Concurrent reception of up to 3 GNSS (GPS, Galileo, GLONASS, BeiDou)
- Industry leading –167 dBm navigation sensitivity
- Security and integrity protection
- Supports all satellite augmentation systems
- Advanced jamming and spoofing detection
- Product variants to meet performance and cost requirements
- Backward compatible with NEO-7 and NEO-6 families

Product description
The NEO-M8 series of concurrent GNSS modules is built on the high performing u-blox M8 GNSS engine in the industry proven NEO form factor.

The NEO-M8 modules utilize concurrent reception of up to three GNSS systems (GPS/Galileo together with BeiDou or GLONASS), recognize multiple constellations simultaneously and provide outstanding positioning accuracy in scenarios where urban canyon or weak signals are involved. For even better and faster positioning improvement, the NEO-M8 series supports augmentation of QZSS, GAGAN and IMES together with WAAS, EGNOS, and MSAS. The NEO-M8 series also supports message integrity protection, geofencing, and spoofing detection with configurable interface settings to easily fit to customer applications.

The NEO-M8M is optimized for cost sensitive applications, while NEO-M8N and NEO-M8Q provide best performance and easier RF integration. The NEO-M8N offers high performance also at low power consumption levels. The future-proof NEO-M8N includes an internal Flash that allows future firmware updates. This makes NEO-M8N perfectly suited to industrial and automotive applications.

The DDC (I2C compliant) interface provides connectivity and enables synergies with most u-blox cellular modules. For RF optimization, the NEO-M8N/Q features an additional front-end LNA for easier antenna integration and a front-end SAW filter for increased jamming immunity.

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”.

<table>
<thead>
<tr>
<th>Grade</th>
<th>NEO-M8M</th>
<th>NEO-M8N</th>
<th>NEO-M8Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive</td>
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<tr>
<td>Professional</td>
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<tr>
<td>Standard</td>
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<table>
<thead>
<tr>
<th>GNSS</th>
<th>NEO-M8M</th>
<th>NEO-M8N</th>
<th>NEO-M8Q</th>
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<tbody>
<tr>
<td>GPS/QZSS</td>
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<td>GLONASS</td>
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<td>Galileo</td>
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<tr>
<td>BeiDou</td>
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| Number of concurrent GNSS | 3 | 3 | 3 |

<table>
<thead>
<tr>
<th>Interfaces</th>
<th>NEO-M8M</th>
<th>NEO-M8N</th>
<th>NEO-M8Q</th>
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<tbody>
<tr>
<td>UART</td>
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<tr>
<td>USB</td>
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<tr>
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<td>DDC (I2C compliant)</td>
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<table>
<thead>
<tr>
<th>Features</th>
<th>NEO-M8M</th>
<th>NEO-M8N</th>
<th>NEO-M8Q</th>
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<tbody>
<tr>
<td>Programmable (Flash)</td>
<td>•</td>
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<tr>
<td>Data logging</td>
<td>•</td>
<td>•</td>
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<tr>
<td>Additional SAW</td>
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<tr>
<td>Additional LNA</td>
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</tr>
<tr>
<td>RTC crystal</td>
<td>C</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>Timepulse</td>
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<tr>
<th>Power supply</th>
<th>NEO-M8M</th>
<th>NEO-M8N</th>
<th>NEO-M8Q</th>
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<tbody>
<tr>
<td>1.65 V – 3.6 V</td>
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<td>•</td>
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<tr>
<td>2.7 V – 3.6 V</td>
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T = TCXO  C = Crystal
NEO-M8 series

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
- Nav. update rate:
  - Single GNSS: up to 18 Hz
  - Concurrent GNSS: up to 10 Hz
- Position accuracy: 2.0 m CEP

Acquisition

- Cold starts:
  - NEO-M8N/Q: 26 s
  - NEO-M8M: 26 s
- Aided starts:
  - NEO-M8N/Q: 2 s
  - NEO-M8M: 3 s
- Reacquisition:
  - NEO-M8N/Q: 1 s
  - NEO-M8M: 1 s
- Sensitivity:
  - Tracking & Nav.: −167 dBm
  - Cold starts: −148 dBm
  - Hot starts: −157 dBm

Assistance GNSS

- AssistNow Online
- AssistNow Off-line (up to 35 days)
- AssistNow Autonomous (up to 6 days)

Oscillator

- TCXO (NEO-M8N/Q)
- Crystal (NEO-M8M)

RTC crystal

- Built-In

Anti jamming

- Active CW detection and removal, Extra onboard SAW band pass filter (NEO-M8N/Q)

Memory

- ROM (NEO-M8N/Q) or Flash (NEO-M8N)

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

- For position, velocity, time, odometer data

Electrical data

- Power supply:
  - 1.65 V to 3.6 V (NEO-M8M)
  - 2.7 V to 3.6 V (NEO-M8N/Q)
- Power Consumption:
  - 21 mA @ 3.0 V (Continuous)
  - 5.3 mA @ 3.0 V Power Save mode (1 Hz)
- Backup Supply: 1.4 V to 3.6 V

Package

- 24 pin LCC (Leadless Chip Carrier): 12.2 x 16.0 x 2.4 mm, 1.6 g

Environmental data, quality & reliability

- Operating temp.: −40 °C to +85 °C
- Storage temp.: −40 °C to +85 °C (NEO-M8N/Q)
- −40 °C to +105 °C (NEO-M8M)
- 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

Interfaces

- Serial interfaces: 1 UART
- 1 USB V2.0 full speed 12 Mbit/s
- 1 SPI (optional)
- 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

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-M8N u-blox M8 GNSS Evaluation Kit, with TCXO, supports NEO-M8N/Q
  - EVK-M8C u-blox M8 GNSS Evaluation Kit, with crystal, supports NEO-M8M

Product variants

- NEO-M8M u-blox M8 concurrent GNSS LCC module, crystal, ROM
- NEO-M8N u-blox M8 concurrent GNSS LCC module, TCXO, Flash, SAW, LNA
- NEO-M8Q u-blox M8 concurrent GNSS LCC module, 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.