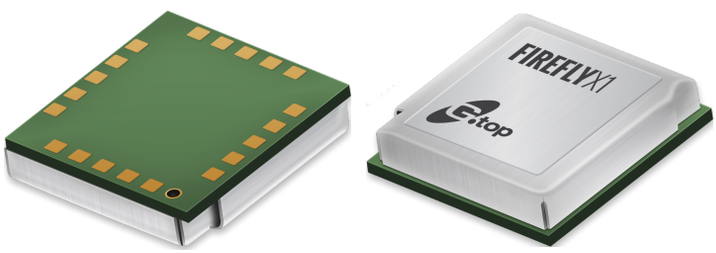
# FireFly Series

Multi-GNSS Standalone




**9.0 x 9.5 x 2.1 mm**

- Multi-GNSS GPS/Glonass/ Beidou/Galileo/QZSS
- Ultra-Compact Smallest MediaTek GNSS Module
- Ultra-low Power Consumption
- Multi-Interfaces I2C, SPI, UART
- High Positioning Accuracy
- EASY™ Technology For Faster TTFF
- Anti-Jamming Technology
- Reliable Quality ROHS, CE, FCC

# FireFly X1

Multi-GNSS Module

## Product Description

The FireFly X1 is the newest entry in the FireFly Module Series, and the smallest MediaTek based module in the world, with an ultra-compact size of 9.0 x 9.5 x 2.1 mm, in a QFN Package.

The FireFly X1 is designed with sophisticated engineering and an entirely new set of ultra-compact quality components to reach this miniature size, while adding more features and interfaces at the same time. It uses the latest MT3333 engine with full support for GPS, QZSS, Glonass, Beidou and is also Galileo ready.

Tracking of up to two constellations simultaneously, and relying on the latest MediaTek firmware, it can provide superior positioning accuracy of up to 1.0m with RTCM. Enabling EASY™ (self-generated orbit prediction), AGPS (ephemeris file injection), and SBAS further enhances position accuracy significantly.

Unlike other compact GNSS modules, despite it's smaller size FireFly X1 incorporates a complete set of high-quality components, including TCXO, RTC Crystal, SMPS, SAW Filter and an additional LNA to provide the most reliable performance.

The FireFly X1 combines miniature size with flexible multi-interface connectivity options like SPI and I²C, that can simplify a user's design, and is ideal for M2M devices relying on low-cost MCU's that offer limited serial interfaces.

GlobalTop's industry leading free customization service further expands the capability of FireFly X1 with unique features such as custom NMEA output sentence, distance calculation, geofencing, magnetic variation and last-position-retention, etc. Advanced users can also customize the basic parameters of the module ,including baud rate, update rate, internal logger settings, DGPS mode, 3D Fix, 1 PPS timing, and many more.

All modules are produced at GlobalTop's in-house ISO 9001:2008 certified manufacturing facility, with 100% unit testing and complete quality control, allowing for a consistent annual yield rate of 99.98%.

With the smallest size, outstanding RF sensitivity and performance, and best-in-class feature-set, the FireFly X1 is an unbeatable choice for any GNSS positioning application.

## Highlights

Smallest MediaTek module, 9.0 x 9.5 x 2.1 mm
Multi-interface support, I²C, SPI and UART
Ultra-low tracking power consumption, 18 mA
Ultra-sensitive tracking, - 165 dBm
Precise positioning accuracy, 1.0m RTCM
GPS/QZSS, GLONASS and BEIDOU support, GALILEO-ready

## Applications

| | |
|---|---|
| Wearables | Personal, pet tracking |
| Fleet management | Vehicle, freight tracking |
| Automotive Telematics | Industrial PDA |
| Timing synchronization | UAV (unmanned air vehicles) |
| eCall / ERA-GlONASS systems | Smart watch, Digital cameras |
| Navigation devices | Avionics |

## Ordering Information

| | |
|---|---|
| Part number | GMM-3301 |
| Default Constellation | GPS / Glonass |
| Packaging | Tape on reel, 1500 pcs per reel |
| Evaluation Kit | GMM-3301-EVB-KIT |
| Firmware configurations | UART + SPI |
| | UART + I²C |
| | UART + RTCM |

To order samples and EVAL-Kits, please contact your local distributor.

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# FireFly X1

GPS/Glonass Module

**Track with GlobalTop**

Quality | Innovation | Customization | Longevity

## Product Features

| | |
|---|---|
| Receiver Type | MT3333 Engine |
| Frequency Bands | GPS L1, GLONASS L1, QZSS L1<br>BEIDOU B1, GALILEO E1, SBAS L1 |
| Channels | Acquisition 99 / Tracking 33 / PRN 210 |
| DGPS (SBAS) | USA EU Japan India<br>WAAS EGNOS MSAS GAGAN |
| Positioning Accuracy | RTCM < 1.0 m<br>Typical < 3.0 m<br>SBAS < 2.5 m |
| Velocity Accuracy | 0.05 m/s (with SBAS)<br>0.10 m/s (without SBAS) |
| Timing Accuracy (1 PPS) | ±10 ns RMS ( 100 ms pulse-width ) |
| Maximum Altitude | 50000 m ( Default : 18000 m ) |
| Maximum Velocity | 515 m/s ( 1000 Knots ) |
| Maximum Acceleration | 4G |
| Anti-Jamming | Active CW detection and removal<br>12 multi-tone interference canceller |
| AGPS | EPO in flash™ 7 - 14 days ephemeris |
| EASY™ | Self-generated orbit prediction |
| AlwaysLocate™ | Intelligent periodic mode algorithm |
| LOCUS™ | Internal data logger, up to 16 hours at 15s intervals ( default setting ) |
| Built-In Components | TCXO, RTC Crystal, Additional LNA<br>SMPS, SAW Filter, Embedded Flash |
| Supported Antennas | Active and Passive |

## Sensitivity

| TTFF (time-to-first-fix) | With EASY™ | Without EASY™ |
|---|---|---|
| Hot Start | 1 Second | 1 Second |
| Warm Start | 5 Seconds | 33 Seconds |
| Cold Start | 15 Seconds | 35 Seconds |

| Sensitivity | |
|---|---|
| Tracking | - 165 dBm |
| Acquisition | - 148 dBm ( Cold Start ) |
| Re-acquisition | - 163 dBm ( Hot Start ) |

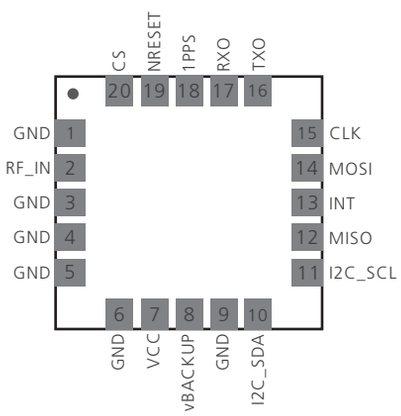
## Interfaces

| | |
|---|---|
| Serial Interfaces | UART, SPI, I²C, RTCM |
| Max. Baud Rate | 115200 bps ( Default : 9600 bps ) |
| Max. Update Rate | 10 Hz ( Default : 1 Hz ) |
| Digital I/O | 1 PPS |
| Protocols | NMEA standard<br>NMEA Secure ( binary, ASCII ) |

## Dimensions

| | |
|---|---|
| 20-Pad QFN Package | 9.0 x 9.5 x 2.1 mm |
| Weight | < 0.7 g |

Pinout




## Electrical Data

| | | | |
|---|---|---|---|
| Supply Voltage | 3.0 V to 4.3 V ( Typical 3.3 V ) | | |
| Backup Supply | 2.0 V to 4.3 V ( Typical 3.0 V ) | | |
| Power Consumption | Mininum | Typical | Maximum |
| Acquisition | 20 mA | 25 mA | 32 mA |
| Power Tracking | 18 mA | 24 mA | 30 mA |
| (GLP) Low Power Tracking | TBD | TBD | TBD |
| Power Saving ( Periodic ) | | | |
| Backup Mode | 9 µA ( Typical ) | | |
| Standby Mode | 350 µA ( Typical ) | | |

## Environmental Data and Approvals

| | |
|---|---|
| Operating Temperature | - 40°C to 85°C |
| Storage Temperature | - 40°C to 85°C |
| Approvals and Compliance | CE, FCC, ROHS, REACH, E911 |

Manufactured at an ISO 9001:2008 certified facility

## Free Firmware Customization

| Basic Functions | Advanced Functions |
|---|---|
| Default baud-rate | NMEA Secure (ASCII, Binary) |
| NMEA sentence interval | Custom NMEA output |
| Datum (222 selections) | Last position retention |
| DGPS mode | Magnetic variation |
| Update rate | Geofencing |
| Data digits after decimal | Distance calculation |
| 3D Fix settings | Navigation mode |
| 1 PPS duration, output | Advanced altitude |
| Active interference canceller | Data-logger customization |



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