Ladybird 3
GPS-Only Antenna Module

Product Description
Ladybird 3 is built based on MT3339 GPS Engine from MediaTek. It is capable of achieving the high level of sensitivity (-165dBm) and instant Time-to-First Fix (TTF). It is designed for lowest power consumption for precise GPS signal processing while giving precise positioning even under low signal, high velocity conditions.

Ladybird 3 has a well-tuned and optimized built-in Patch Antenna that offers excellent performance, and relieves the developer from Antenna integration. Power management design allows Ivory 3 to be integrated easily into your system without extra voltage regulator. Ladybird 1 also allows direct battery connection without the need for an external LDO and gives customers plenty of choices for their application circuit.

Ladybird 3 includes features such as SBAS, Anti-Jamming, AlwaysLocate™, EASY™, EPO™, and logger function. Ladybird 1’s feature set, especially its ultra-low power consumption make it suitable for power sensitive and portable applications.

GlobalTop’s industry leading free customization service further expands the capability of Ladybird 3 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%.

Highlights
- Embedded Patch Antenna, 16 x 16 x 6.2 mm
- Free and extensive FW customization
- Ultra-low tracking power consumption, 16 mA
- Ultra-sensitive tracking, -165 dBm
- Built-in LNA, SAW-Filter, TCXO, RTC Crystal, AGPS, SBAS for better accuracy

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

Ordering Information
- Part number: PA6C
- Default Constellation: GPS Only
- Packaging: Tape on reel, 1500 pcs per reel
- Evaluation Kit: PA6C-EVB-KIT
- Firmware configurations: Standard, Customized

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

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**Product Features**

- **Receiver Type**: MT3339 Engine
- **Frequency Bands**: GPS L1, QZSS L1, SBAS L1
- **Channels**
  - Acquisition: 66
  - Tracking: 22
  - PRN: 210
- **DGPS (SBAS)**: USA, EU, Japan, India, WAAS, EGNOS, MSAS, GAGAN
- **Positioning Accuracy**
  - Minimum: < 2.0 m
  - Typical: < 3.0 m
  - SBAS: < 2.5 m
- **Velocity Accuracy**
  - 0.05 m/s (with SBAS)
  - 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
- **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, LDO, SAW Filter, Embedded Flash
- **External Antenna Interface**: None

**Sensitivity**

- **TTFF (time-to-first-fix)**
  - With EASY™: Hot Start 1 Second, Warm Start 5 Seconds, Cold Start 15 Seconds
  - Without EASY™: Hot Start 1 Second, Warm Start 33 Seconds, Cold Start 35 Seconds
- **Tracking Sensitivity**: -165 dBm
- **Acquisition Sensitivity**: -148 dBm (Cold Start), -163 dBm (Hot Start)

**Interfaces**

- **Serial Interfaces**: UART
- **Max. Baud Rate**: 115200 bps (Default: 9600 bps)
- **Max. Update Rate**: 10 Hz (Default: 1 Hz)
- **Digital I/O**: 1 PPS
- **Protocols**: NMEA standard, NMEA Secure (binary, ASCII)

**Dimensions**

- **20-Pin LCC Package**: 16 x 16 x 6.2 mm
- **Weight**: 5.65 g

**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**
  - Acquisition: Minimum 19 mA, Typical 29 mA, Maximum 37 mA
  - Power Tracking: Minimum 16 mA, Typical 23 mA, Maximum 30 mA
- **GLP Low Power Tracking**: TBA
- **Power Saving (Periodic)**
  - Backup Mode: 9 µA (Typical)
  - Standby Mode: 180 µA (Typical)

**Environmental Data and Approvals**

- **Operating Temperature**: -40ºC to 85ºC
- **Storage Temperature**: -40ºC to 85ºC
- **Approvals and Compliance**: CE, FCC, ROHS, REACH, E911
- **Manufactured at an ISO 9001:2008 certified facility**

**Free Firmware Customization**

**Basic Functions**

- Default baud-rate
- NMEA sentence interval
- Datum (222 selections)
- DGPS mode
- Update rate
- Data digits after decimal
- 3D Fix settings
- 1 PPS duration, output

**Advanced Functions**

- NMEA Secure (ASCII, Binary)
- Custom NMEA output
- Last position retention
- Magnetic variation
- Geofencing
- Distance calculation
- Navigation mode
- Advanced altitude
- Data-logger customization

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