GM-5153 / GM-5154,

Ultra-High Performance

GNSS Smart Antenna Module

Overview
GM-5153/GM-5154 is a thin, compact, easy to use, high performance low power GNSS smart antenna module with patch antenna for various location and timing applications. GM-5153/GM-5154 support multiple satellite positioning systems – GPS, GLONASS, Beidou, QZSS and SBAS.

Based on our experienced design, GM-5153/GM-5154 fully exhibits the excellent performance of MT3333 chip. It works in GNSS signal difficult environment, provides fast acquisitions and excellent tracking performance.

Applications
● Driving recorder
● Automatic vehicle location
● Vehicle navigation device
● Marine GPS plotters
● Timing (GPS clock, FEMTO cell, traffic lights etc.)

Features
● Multi- satellite positioning systems support
  ■ GPS/QZSS/GLONASS (GM-5153)
  ■ GPS/QZSS/Beidou (GM-5154)
● Compact and thin – 15 x 15 x 6.5 (mm)
● High performance: -165dBm tracking sensitivity
● Low power: 26 mA at continuous tracking
● SBAS (WAAS, EGNOS, MSAS, GAGAN) support
● Up to 3-day self-generated orbit predictions
● AGPS – up to 30-day orbit predictions from server
● 12 multi-tone active interference cancellers

Applications
● Indoor/outdoor multi-path detection & compensation
● Up to 10Hz update rate
● Optional data logger
● High accuracy 1PPS timing
● Easy to use: built-in patch antenna & 6-pin wire to board connector
● V_BAT pin support for faster position fix
● Green LED for position fix indication
● Fully EMI shielded
● Industrial operating temperature range: -40 ~ 85°C

Notes
1. Some features need special firmware or command programmed by customer
2. MOQ-based customization is welcome.

Technical Specifications

<table>
<thead>
<tr>
<th>Receiver Type</th>
<th>GNSS Chipset: MT3333</th>
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<tbody>
<tr>
<td></td>
<td>GPS, QZSS: L1 1575.42MHz,</td>
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<tr>
<td></td>
<td>GLONASS (GM-5153):</td>
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<tr>
<td></td>
<td>L1OF 1598.0625 ~ 1605.375 MHz</td>
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<tr>
<td></td>
<td>BEIDOU (GM-5154):</td>
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<tr>
<td></td>
<td>B1 1561.098 MHz</td>
</tr>
<tr>
<td>Channels:</td>
<td>Tracking: 33 /acquisition: 99</td>
</tr>
<tr>
<td>Horizontal</td>
<td>&lt; 3.0m (Autonomous)</td>
</tr>
<tr>
<td>Position</td>
<td>&lt; 2.5m (WAAS)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>(50% 24hr static, -130dBm)</td>
</tr>
<tr>
<td>Velocity</td>
<td>&lt;0.1 m/s (speed, w/o SBAS)</td>
</tr>
</tbody>
</table>
### Accuracy
- <0.05 m/s (speed w/ SBAS)
  (50%@30m/s)

### Timing Accuracy
- ±10ns RMS (1PPS output)

### Time To First Fix
- Autonomous
  - Hot start: <1sec, average
  - Warm start: 24sec, average
  - Cold start: 28sec, average
- Reacquisition: (50% -130dBm)

### Sensitivity
- (Autonomous) -165dBm (tracking)
- (Acquisition) -148dBm

### Update Rate
- Up to 10Hz, default 1Hz

### Max. Altitude
- <18,000 m

### Max. Velocity
- <1,852 km/hr

### Datum
- WGS-84 (default)

### Protocol Support
- NMEA 0183 V4.1, MTK NMEA
- 4800/9600 (default)/38400/115200 bps
- N,8,1 (No parity, 8 data bits, 1 stop bit)
  - Default: GGA, GSA, RMC, VTG@1Hz, GSV@1/5Hz, GLL, ZDA@0Hz

### SBAS Support
- WAAS, EGNOS, MSAS, GAGAN

### Dynamics
- <4g

*Please contact Navisys for any customization demand.

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### Electrical Data

#### Power Supply
- 2.8 ~ 4.3 V

#### Power Consumption
- 26mA/average tracking

#### Backup Power (V_BAT)
- 2.1 ~ 4.2 V
- Power consumption: 15.5uA

#### TTL I/O
- **V_HI**: 2.1~3.1V, **V_L**: 0~0.7V
- **V_OH**: ≥2.38V, **V_OL**: 0.42V

#### Protocols
- NMEA, MTK NMEA

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### Environmental Data

#### Operating temperature
- -40 ~ 85°C

#### Storage temperature
- -40 ~ 85°C

#### Vibration
- 5Hz to 500Hz, 5g

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*This document is subject to change without notice.*