GR-M52, Concurrently Track All Civil Navigation Systems, GPS/GNSS Smart Antenna

RoHS Compliant



Overview

Based on the AG3352 chip, GR-M52 is able to **concurrently track L1** signals from **all civil navigation systems**, i.e. GPS, GLONASS, GALIELO, BEIDOU, QZSS, and SBAS **in a small & compact dimension**. Thanks to this capability, big number of satellites are visible, positioning becomes easy and accurate even in the typical GPS difficult environments.

GR-M52 is a plug-and-play GNSS smart antenna that includes antenna, backup battery, LED, connector, and all circuits necessary for G3B high quality positioning.

In this small dimension, it also supports different communication options such as TTL, RS232, and USB.

=G3B: GPS/GLONASS/GALILEO/BEIDOU

Applications

- FCC AFC for Wi-Fi 6E AP
- Navigation (autos, trains, boats, pedestrians etc.)
- ELD (Electronic Logging Device)
- Timing (precise clock, NTP time server, traffic lights etc.)

Features

- Based on AG3352 G3B chip
- Concurrently tracks all civil navigation systems!
  - Multi-constellation: GPS, GLONASS, GALILEO, BEIDOU, QZSS, SBAS
  - SBAS ranging (WAAS, EGNOS, MSAS, GAGAN)
- Small, 40 x 45 x 16 only, in mm
- Compact with IPX7 Waterproof
- High performance: -165dBm tracking sensitivity
- Smart jammer detection and suppression on GPS, GLONASS, Galileo, BEIDOU bands.
- 12 multi-tone AIC (active interference canceller) for removing unwanted signals.
- Indoor and outdoor multi-path detection and compensation
- PPS of ±10ns accuracy with adjustable duty cycle
- Up to 10Hz update rate
- RTCM ready (v2.3 and v3.3)
- AGPS/AGNSS for faster position fix
  - EPO™ (Extended Prediction Orbit) orbit prediction
  - EASY™ (Embedded Assist System) self-generated orbit prediction
- LOCUS™ logger function
- All-in-one, plug-n-play smart antenna
  - Built-in G3B= GNSS antenna
  - Connector, cable length could be customized
  - Built-in LED for position fix indication
  - UART/RS232/USB option
  - Backup battery for faster position fix
- Built-in magnet
- Fully EMI shielded
- Industrial operating temperature range: -40 ~ 85℃

Note: ™ Airoha trade mark

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! Because of positioning algorithm, it is normal if there is no SV for some satellite system at the beginning.

Technical Specifications

Receiver Performance Data+

Receiver Type	AG3352, L1: 1602 MHz: GLONASS:L1OF 1575.42 MHz GPS & QZSS: L1 C/A SBAS: L1 QZSS L1 SAIF Galileo: E1 (E1B+E1C) BEIDOU B1C& 1561.098 MHz BEIDOU B1I
Horizontal Position Accuracy	2.5m (50% 24hr static, -130dBm)
Vertical Position Accuracy	3.75m (50% 24hr static, -130dBm)
Velocity Accuracy	<0. 05 m/s (speed, autonomous) (50%@30m/s)
Time Pulse Signal Accuracy	± 10 ns clear sky, 1-sigma
Time To First Fix Hot start Warm start Cold start	Autonomous (50% -130dBm) 1sec < 25sec < 25sec
Sensitivity (Autonomous)	Acquisition: -148dBm Tracking: -165dBm
Max. Update Rate	10Hz (default 1Hz)
Max. Altitude	<18,000 m
Max. Velocity	<1,852 km/hr
Protocol Support	NMEA V3.01 & V4.10
	GGA, GSA, GSV, RMC, VTG UART: N-8-1 9600/38400/115200(default)bps Proprietary PAIR command Proprietary Binary sentence
SBAS Support	WAAS, EGNOS, MSAS,GAGAN
AGPS/AGNSS	● EPO data: GPS, GLONASS, Galileo, Beidou ● EASY: GPS ● NVRAM auto saving
Dynamics	<4g

+ Note. According to IC Spec

& B1C is supported only at GNSS "GPS+BEIDOU" mode.

Electrical Data

Power Supply (VCC)	3.3 ~ 5 V (TTL, RS232) 4.5 ~ 5.5 V (USB)
Power Consumption (Average Tracking)	36mA/TTL, 36 SVs used in fix
Backup Power (V_BAT)	2~5 V
TTL I/O	V_{IH}: 2~3.6V, V_{IL}: 0~0.8V V_{OH}: ≥2.4V, V_{OL} ≤ 0.4V

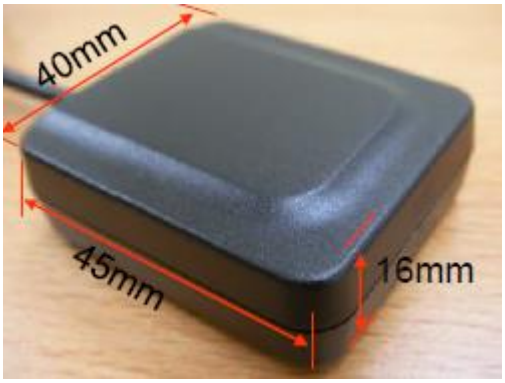
Environmental Data

Operating temperature	-40 ~ 85℃ w/o battery -20~60℃ w/ battery
Storage temperature	-40 ~ 85℃ except battery: -40~60℃
Operating humidity	5% ~ 95% non-condensing
Waterproof	IPX7

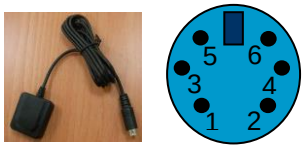
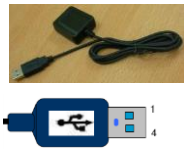
Mechanical Data (mm)

40 x 45 x 16

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Interfaces/ Ordering Information%

GR-M52 P/Q/R/T	GR-M52U
	
Mini-Din 6-pin PS/2 Male Plug	USB type A, Male Plug

Pin	GR-M52P	GR-M52Q	GR-M52R	GR-M52T	GR-M52U
1	GND	GND	GND	GND	VDD 5V
2	VCC	VCC	VCC	VCC	D-
3	TX-RS232	TX-RS232	-	TXD-TTL	D+
4	RX-RS232	RX-RS232	RX-RS232	PWR_CTL	GND
5	1PPS-TTL	1PPS-RS232&	TX-RS232	1PPS-TTL	-
6	-	-	-	RXD-TTL	-

& Please be noted that the RS232 line transceiver would introduce 0.3 us pulse skew to the 1PPS signal of RS232 model.

% Customization of firmware/hardware are welcome.

* This document is subject to change without notice.

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