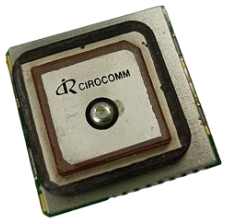
GM-M04: L1/L5 Dual-Band GNSS Smart Antenna Module with Compass Support & Multi-Constellation Tracking



RoHS Compliant

Overview

Powered by the 12nm AG3335 platform, the GM-M04 supports all major civilian GNSS constellations — GPS, GLONASS, Galileo, BeiDou, QZSS, and NavIC — and further extends capability with an integrated Compass system on the module. With access to more satellites and improved geometry, the module delivers faster and more robust positioning. Its concurrent L1/L5 dual-band reception minimizes ionospheric and tropospheric errors, enabling significantly higher accuracy compared to single-band GNSS. These combined advantages ensure dependable performance even in environments where traditional GPS signals are challenged.

The GM-M04's exceptional performance is enabled by its carefully engineered antenna, integrated Compass module, status LED, robust connector, and optimized dual-band signal circuitry. Every component is designed to ensure stable reception and reliable operation across diverse environments. This compact GM-M04 is a true plug-and-play GNSS smart antenna, allowing users to achieve high-performance dual-band positioning with minimal integration effort.

Applications

- UAV (Unmanned Aerial Vehicle)
- Navigation (autos, trains, boats, pedestrians etc.)
- ELD (Electronic Logging Device)

Features

- Based on the 12nm technology AG3335 chip
- 135 channels, tracks all civil navigation systems
- Concurrent tracking of positioning satellites
  - L1/L5 dual-band
  - Multi-constellation: GPS, GLONASS, Galileo, BeiDou, QZSS, NavIC
  - SBAS ranging (WAAS, EGNOS, MSAS, GAGAN)
- SLAS (Sub-meter Level Augmentation) support in Japan
- High performance: -165dBm tracking sensitivity
- Support of smart jammer detection on GPS, GLONASS, Galileo, BeiDou bands.
- 12 multi-tone AIC (active interference canceller) in both L1/L5 bands for removing unwanted signals.
- Indoor and outdoor multi-path detection and compensation
- Up to 10Hz update rate
- RTCM ready (v2.3 and v3.3)
- AGPS/AGNSS

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- 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 module
  - Built-in L1/L5 dual-band G3B= GNSS antenna
  - Built-in wire-to-board digital connector
  - Built-in backup battery for faster position fix
  - Built-in LED for position fix indication
    - Blinking: GNSS fixed
    - On: GNSS unfixed
  - Built-in compass, BMM350 (±2000μT, 3-axis)
- Fully EMI shielded
- Industrial operating temperature range: -40 ~ 85℃

Note: ™ Airoha trade mark

=G3B: GPS/GLONASS/Galileo/BeiDou

Technical Specifications

Receiver Performance Data+

Receiver Type	135 channels, L1: 1602 MHz: GLONASS: L1OF 1575.42 MHz GPS & QZSS: L1 C/A SBAS: L1 QZSS L1 SAIF Galileo: E1 (E1B+E1C) 1561.098 MHz BeiDou B1I L5: 1176.45 MHz GPS & QZSS: L5 Galileo: E5a BeiDou: B2a NavIC SPS
Horizontal Position Accuracy	1.5m (L1+L5 dual-band) (50% 24hr static, -130dBm)
Vertical Position Accuracy	2.25m (L1+L5 dual-band) (50% 24hr static, -130dBm)
Velocity Accuracy	<0.05 m/s (speed, autonomous) (50%@30m/s)
Time To First Fix Hot start Warm start Cold start	Autonomous (50% -130dBm) 1sec 24sec 24sec
Sensitivity (Autonomous)	Acquisition: -148dBm Tracking: -165dBm
Max. Update Rate	10Hz (default 5Hz)
Max. Altitude	<18,000 m
Max. Velocity	<1,852 km/hr
Protocol Support	NMEA V3.01 & V4.10 GGA, GSA, GSV, RMC UART: N-8-1 230400(default)/115200/921600bps Proprietary PAIR command Proprietary Binary sentence
SBAS Support	WAAS, EGNOS, MSAS, GAGAN
AGPS/AGNSS	● EPO data: GPS, GLONASS ● QEPO data: GPS, GLONASS, Galileo, BeiDou ● EASY: GPS
Dynamics	8g, under drone mode

+ Note. According to IC Spec

Compass BMM350

Magnetic Field Range (Typical)	±2000 μT (all axes)
Resolution	16-bit
Maximum	400Hz (Normal mode)

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Sample Rate	

Electrical Data

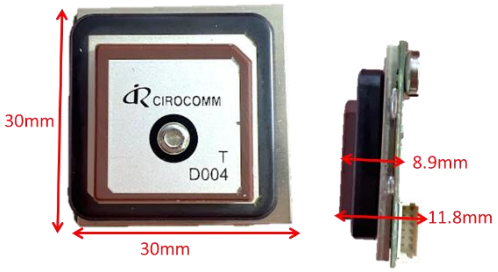
Power Supply (VCC)	3.3 ~ 5 V (TTL)
Power Consumption (average tracking, 77-SV in fix)	56mA (TTL)
TTL I/O	V_{IH}: 2~3.15V, V_{IL}: 0~0.8V V_{OH}: >2.1V, V_{OL}< 0.72V

Environmental Data

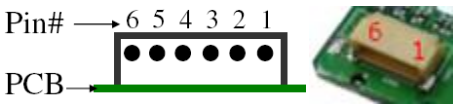
Operating temperature	-40 ~ 85℃ except battery: -20~60℃
Storage temperature	-40 ~ 85℃ except battery: -40~60℃
Vibration	5Hz to 500Hz, 5g
Shock	Half sine 30g/11ms

Others

Dimension	30*30*11.8 mm^3
Weight	19.2 g



6-pin Interface, pitch 1.0mm



Pin	Name	Function	I/O
1	GND	Ground	Input
2	VCC	Power supply	Input
3	TXD-TTL	TTL level serial data output	Output
4	RXD-TTL	TTL level serial data input	Input
5	I2C_SCL	I2C clock of compass	Input
6	I2C_SDA	I2C data of compass	I/O

Ordering Information

GM-M04X

Model	Description
GM-M04T	EOL, L1/L5 Dual-Band GNSS Smart Antenna Module with Compass, MMC5983MA
GM-M04B	L1/L5 Dual-Band GNSS Smart Antenna Module with Compass, BMM350

Optional Accessory:

- Pixhawk GPS2 Cable (6-Pin JST-GH to 6-Pin), length: 30cm

Note: Customization available upon request with MOQ. Please contact sales.

* This document is subject to change without notice.

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