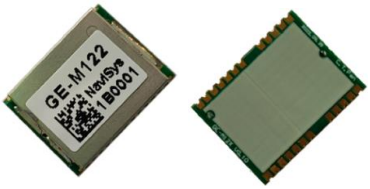
GE-M122, L1/L5 Dual-band, Concurrent Multi-satellite Systems, GNSS Engine Board

RoHS Compliant



Overview

Based on the AG3335 chip by 12nm technology, GE-M122 is able to simultaneously track signals from all civil navigation systems, i.e. GPS, GLONASS, GALILEO, BEIDOU, QZSS and NavIC. In addition, it also tracks L1 and L5 bands simultaneously which allows better positioning accuracy. Thanks to this capability, positioning becomes easy even in the typical GPS difficult environments.

To simplify the dual-band RF design, GE-M122 allows direct connection of passive patch antenna without additional gains added.

Applications

- Navigation (autos, trains, boats, pedestrians etc.)
- Tracking (tracker, racing cars etc.)
- Timing (precise clock, FEMTO cell, traffic lights etc.)

Features

- Simultaneous tracking of
  - L1/L5 dual-band
  - Multi-constellation: GPS, GLONASS, Galileo, BEIDOU, QZSS, and NavIC.
  - SBAS ranging (WAAS, EGNOS, MSAS, GAGAN)
- SLAS (Sub-meter Level Augmentation Service) 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
- PPS of ±10ns accuracy with adjustable duty cycle
- Up to 10Hz update rate
- RTCM ready (v2.3 and v3.3)
- AGPS/AGNSS
  - EPO™ (Extended Prediction Orbit) orbit prediction
  - EASY™ (Embedded Assist System) self-generated orbit prediction
- LOCUS™ logger function
- Fully EMI shielded
- Industrial operating temperature range: -40 ~ 85℃

Note: ™ Airoha trade mark

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

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	L5: 1176.45 MHz GPS & QZSS: L5 Galileo: E5a BEIDOU: B2a NavIC: L5
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 Pulse Signal Accuracy	± 10 ns clear sky, 1-sigma
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 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 38400/115200(default)/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	<4g

+ Note. According to IC Spec

Electrical Data

Power Supply (VCC)	3 ~ 5 V
Power Consumption	57mA/average tracking
Backup Power (V_BAT)	2~5 V
TTL I/O	V_{IH}: 1.75~3.1V, V_{IL}: -0.3~0.7V V_{OH}: ≧2.1V, V_{OL}≦ 0.35V

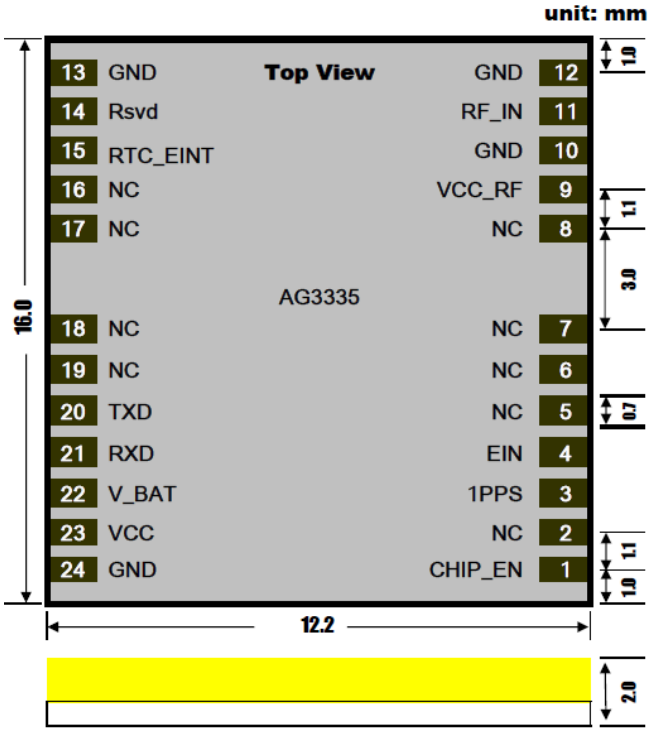
Environmental Data

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

Mechanical Data (mm)

12.2 x 16.0 x 2.0

24-pin Interface,



Pin	Name	Function	I/O
1	CHIP_EN	Pull low (0) to power OFF. Pull high (1) to power ON. Leave it open if this pin is not used.	Input

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2	NC	No connection	-
3	1PPS	One pulse per second,	Output
4	EIN	External interrupt Leave it open if this pin is not used.	Input
5	NC	No connection	-
6	NC	No connection	-
7	NC	No connection	-
8	NC	No connection	-
9	VCC_RF	VCC antenna power supply option. Leave it open if this pin is not used.	Output
10	GND	Ground	Input
11	RF_IN	GNSS signal from antenna	Input
12	GND	Ground	Input
13	GND	Ground	Input
14	Reserved	Leave it open.	Output
15	RTC_EINT	Pull high 1ms to wakeup it from the low power RTC mode. Leave it open if this pin is not used.	Input
16	NC	No connection	-
17	NC	No connection	-
18	NC	No connection	I/O
19	NC	No connection	I/O
20	TXD	UART TXD	Output
21	RXD	UART RXD	Input
22	V_BAT	Backup power input	Input
23	VCC	Power supply	Input
24	GND	Ground	Input

Ordering Information

GE-M122N[!]	115200bps GGA, GSA, GSV, RMC, VTG

[!] Baud rate and output sentences are customizable.

* This document is subject to change without notice.

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