

# GE-A12, Mini and Powerful GNSS Engine Board

RoHS  
Compliant



## Overview

This 12.2x16.0 (mm) GNSS engine board is tiny while exhibits unprecedented powerful performance. Antenna short circuit protection prevents it from incidental damage. Both active & passive antennas are supported. Active antenna connection does not require any external RLC circuits.

Based on our experienced design, GE-A12 fully exhibits the excellent performance of SiRFstarV chip. It works in GNSS signal difficult environment, providing fast acquisitions and excellent tracking performance.

## Applications

- DSC, driving recorder
- Tablets, mobile devices
- Tracking (vehicle, person, asset, pet etc.)
- Timing (GPS clock, FEMTO cell, traffic lights etc)

## Features

- Multi-constellation support: GPS, QZSS, GLONASS, BEIDOU, SBAS, Galileo ready
- SBAS support: WAAS, EGNOS, MSAS, GAGAN
- High performance: -165dBm tracking sensitivity
- Low power consumption: 26mA
- External backup power by pin V\_BAT for faster position fix.
- Support both active and passive antenna.
- Built-in filtered power for active antenna. Do not need external filtering circuit.

- Antenna short circuit protection
- Up to 5Hz update rate
- A-GNSS support
- Built-in flash for firmware upgrade
- Mitigation of signal interference
- Fully EMI shielded
- Industrial operating temperature range: -40 ~ 85°C

## Technical Specifications

### Receiver Performance Data\*

Receiver Type	52 channels, L1 frequency, C/A code GPS & QZSS:1575.42MHz GLONASS: 1598.0625~1605.375MHz BEIDOU: 1561.098MHz
Horizontal Position Accuracy	< 2.5m (Autonomous) (50% 24hr static, -130dBm)
Velocity Accuracy	<0.01 m/s (speed, autonomous) <0.01° (heading) (50%@30m/s)
Time To First Fix	Autonomous Hot start <1sec Warm start <26sec Cold start <28sec (50% -130dBm)
Sensitivity (Autonomous)	Acquisition: -146dBm GPS -145dBm GLONASS -142dBm BEIDOU Tracking: -165dBm GPS

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	-162dBm GLONASS -155dBm BEIDOU Navigation: -162dBm GPS -162dBm GLONASS -155dBm BEIDOU (-142dBm 28dB-Hz with 4dB noise figure)
Max. Update Rate	5Hz
Max. Altitude	<18,000 m
Max. Velocity	<1,852 km/hr
Protocol Support	UART: N81; NMEA V4.00: 9600/19200/38400/115200 bps GGA, GSA, GSV, RMC, VTG OSP: 115200bps
SBAS Support	WAAS, EGNOS, MSAS, GAGAN
Dynamics	<4g

\* Note. According to IC Spec

### Electrical Data

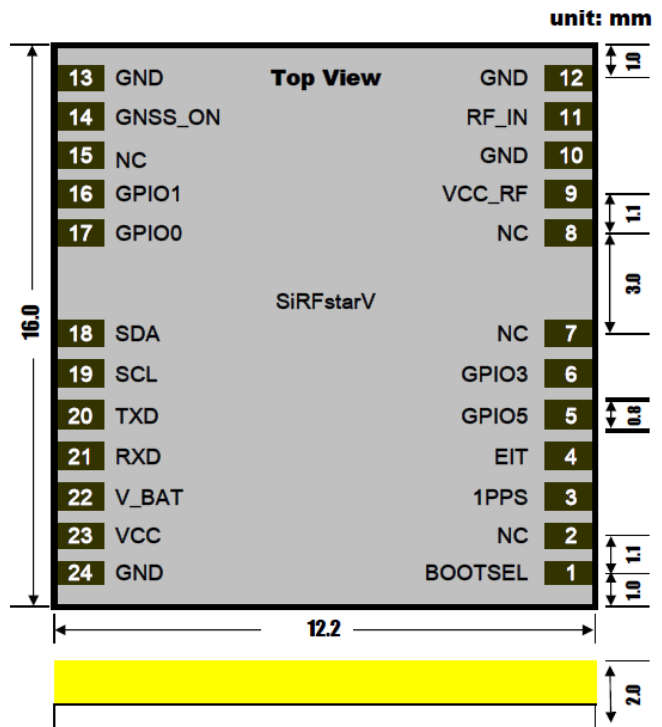
Backup Power (V_BAT)	2.6V ~ 3.4V
Power Supply (VCC)	2.6 V ~ V_BAT+0.3 V 3.3V ~ 4.4V if no V_BAT
Power Consumption	VCC: 26mA/average tracking VBAT: 41.3uA
TTL I/O	V <sub>IH</sub> : 0.7 x V_BAT ~ 3.6V, V <sub>IL</sub> : 0 ~ 0.4V V <sub>OH</sub> : ≥ 0.75 x V_BAT, V <sub>OL</sub> : ≤ 0.4V
Protocols	NMEA V4.00, OSP

### Environmental Data

Operating temperature	-40 ~ 85°C
Storage temperature	-40 ~ 85°C
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	BOOTSEL	“NC” or “L” for normal run; “H”: for firmware upgrade	Input
2	NC	No connection	-
3	1PPS	One pulse per second,	Output
4	EIT	External interrupt	Input
5	GPIO5	General Purpose I/O control pin 5	I/O
6	GPIO3	General Purpose I/O control pin 3	I/O
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	GPS signal from antenna	Input
12	GND	Ground	Input
13	GND	Ground	Input
14	GNSS_ON	RF ON indication	Output
15	NC	No connection	-
16	GPIO1	General Purpose I/O control pin 1	I/O
17	GPIO0	General Purpose I/O control pin 0	I/O
18	SDA	I2C data	I/O
19	SCL	I2C clock	Output
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-A12N	9600bps GGA, GSA, GSV, RMC, VTG
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\*This document is subject to change without notice.