

## GE-5103, GE-5104

### Ultra-High Performance

### Tiny GNSS Engine Board

#### Overview

GE-5103/GE-5104 is equipped with the MT3333 GNSS engine. This SMT mountable GNSS engine board measures just 10x12x2.6 (mm). The slim design allows it to be used in dimension demanding devices.

In addition, this low power engine supports multiple satellite positioning systems – GPS, GLONASS, Beidou, QZSS and SBAS.

Based on our experienced design, GE-5103/GE-5104 fully exhibits the excellent performance of MT3333. It works in GPS signal difficult environment, providing fast acquisitions and excellent tracking performance.

#### Applications

- Automatic Vehicle Location, Navigation
- Timing (GPS clock, FEMTO cell, traffic lights etc)
- Industrial PC, POS, ITS, Telematics
- Driving recorder, camera detector

#### Features

- Multi-satellite positioning systems support
  - GPS/QZSS/GLONASS (GE-5103)
  - GPS/QZSS/Beidou (GE-5104)
- SBAS (WAAS, EGNOS, MSAS, GAGAN) support
- High performance: -165dBm tracking sensitivity
- Low power: 22mA at continuous tracking
- Tiny: 10 (W) x 12 (L) x 2.6 (H) (mm)
- 12 multi-tone active interference cancellers

RoHS  
Compliant



- Indoor/outdoor multi-path detection & compensation
- Up to 10Hz update rate<sup>1</sup>
- RTCM support<sup>1</sup>.
- High accuracy ( $\pm 10$ ns jitter) timing pulse: PPS
- External backup power by pin V\_BAT for faster position fix. Do not need additional charging circuit.
- Support both active and passive antennas.
- Built-in filtered power for active antenna. Do not need external filtering circuit.
- Combined with many advanced features, including AlwaysLocate, AGPS and loGEer function.
- 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

##### Receiver Performance Data

Receiver Type	GPS Chipset: MT3333 GPS/QZSS: L1 1575.42MHz GLONASS (GN-5103): L1OF 1598.0625 ~ 1605.375 MHz BEIDOU (GM-5104): B1 1561.098 MHz C/A code: 1.023 MHz chip rate Channels: Tracking: 33 /acquisition: 99
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Horizontal Position Accuracy	< 3m (Autonomous) < 2.5m (WAAS) (CEP 50% 24hr static, -130dBm)
Velocity Accuracy	<0.1 m/s (speed, autonomous) <0.05 m/s (speed, SBAS) (50%@30m/s)
Timing Accuracy	±10ns jitter (PPS output)
Time To First Fix	Autonomous Hot start <1sec Warm start <24sec Cold start <28sec (50% -130dBm)
Sensitivity (Autonomous)	-148dBm (acquisition) -165dBm (tracking) (-142dBm 28dB-Hz with 4dB noise figure)
Max. Update Rate	Up to 10Hz, default 1Hz
Max. Altitude	<18,000 m
Max. Velocity	<1,852 km/hr
Protocol Support	NMEA 0183 V4.1, MTK NMEA 4800/9600(default)/38400/115200bps N,8,1 (No parity, 8 data bits, 1 stop bit); Default: GEA, GSA, RMC, VTG@1Hz GSV@1/5Hz, GLL, ZDA@0Hz
SBAS Support	WAAS, EGNOS, MSAS, GAGAN
Dynamics	<4g

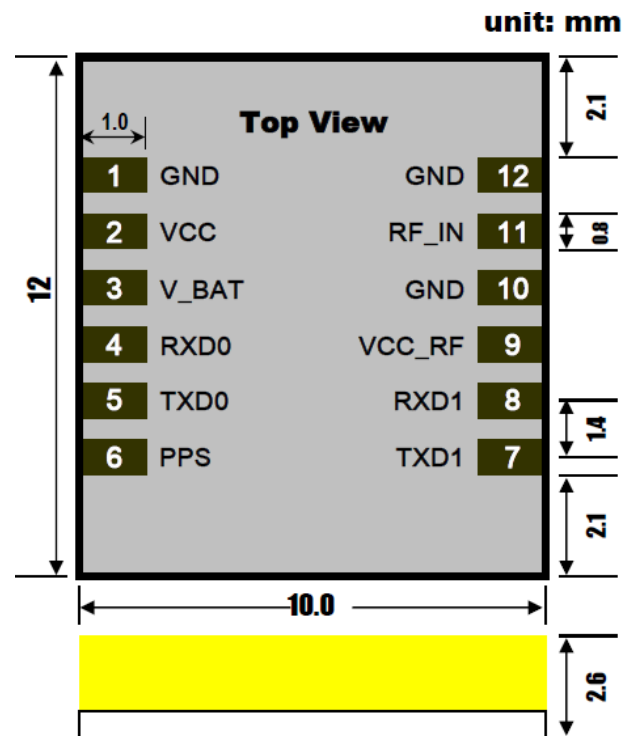
### Electrical Data

Power Supply	3 ~ 4.3 V
Power Consumption	22mA/average tracking
Backup Power (V_BAT)	2~4.3V
TTL I/O	V <sub>IH</sub> : 2.1~3.1V, V <sub>IL</sub> : 0~0.7V V <sub>OH</sub> : ≥2.38V, V <sub>OL</sub> ≤ 0.42V
Protocols	NMEA, MTK Proprietary NMEA

### Environmental Data

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

### Mechanical Data – 10 x 12 x 2.6(mm)



### 12-pin LCC (Leadless Chip Carrier) Interface

Pin	Name	Function	I/O
1	GND	Ground	Input
2	VCC	Power supply	Input
3	V_BAT	Backup battery power supply	Input
4	RXD0	Port 0 TTL serial data input (to GPS)	Input
5	TXD0	Port 0 TTL serial data output (from GPS)	Output
6	PPS	Default: 1 pulse per second (1Hz), synchronized with GPS or UTC time at rising edge, pulse width 100ms.	Output
7	TXD1	Port 1 TTL serial data output (from GPS)	Output
8	RXD1	Port 1 TTL serial data input (to GPS)	Input
9	VCC_RF	RF power for active antenna	Output

10	GND	Ground	Input
11	RF_IN	RF signal	Input
12	GND	Ground	Input

### **Ordering Information**

#### **GE-5103X, GE-5104X**

X=A	9600bps, GGA, GSA, RMC, VTG@1Hz, GSV@1/5Hz
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\*This document is subject to change without notice.