GM-M71, SMT Mountable GNSS Module, Concurrently Track All Civil Navigation Systems

RoHS Compliant



Overview

GM-M71 is an easy to use, ultra-high performance, low power GNSS receiver module with patch antenna for various PNT (Position/Navigation/Timing) applications. It concurrently tracks signals from all civil navigation systems – GPS, QZSS, GALILEO, GLONASS, and BEIDOU. Thanks to this capability, big number of satellites are visible, positioning becomes easy and accurate even in the typical GPS difficult environments. The **SMT mountable** design allows mass production with automatic assembly.

With GM-M71, the RF tuning efforts and also development time is reduced to the minimum.

Applications

- Marine GPS/GNSS plotters
- Vehicle navigation devices
- Driving recorders
- Timing (precise clock, FEMTO cell, traffic lights etc)
- High air balloons

Features

- High performance: -165dBm tracking sensitivity
- Low power: 34mA at continuous tracking
- SMT Mountable with built-in antenna
- Tracks all civil navigation systems
- Concurrent tracking of positioning satellites[1]
  - Multi-constellation: GPS, GLONASS, GALILEO, BEIDOU, QZSS, SBAS
  - SBAS ranging (WAAS, EGNOS, MSAS, GAGAN, BDSBAS)
- SLAS (Sub-meter Level Augmentation Service) support in Japan
- Up to 10Hz update rate
- 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
- 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
- V_BAT pin support for faster position fix
- LED for position fix indication
- Fully EMI shielded
- Industrial operating temperature range: -40 ~ 85℃

Notes

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	L1: 1602 MHz: GLONASS:L1OF

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	1575.42 MHz GPS & QZSS: L1 C/A SBAS: L1 QZSS L1 SAIF Galileo: E1 (E1B+E1C) BeiDou B1C 1561.098 MHz BEIDOU B1I Note: Only support BeiDou B1C at GNSS "GPS+BeiDou" Mode.
Horizontal Position Accuracy	< 2.5m (Autonomous) (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
Update Rate	Up to 10Hz, default 1Hz
Max. Altitude	<18,000 m
Max. Velocity	<1,852 km/hr
Datum	WGS-84(default)
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

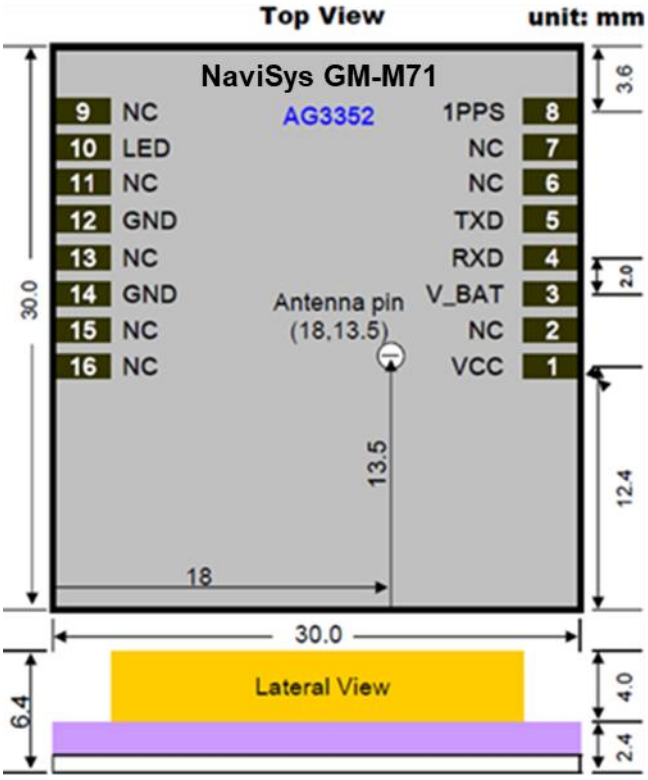
Electrical Data

Power Supply	3.3 ± 0.3 VDC
Power Consumption	34mA average tracking
Backup Power (V_BAT)	1.62 ~ 3.63 VDC
Digital I/O (at VCC = 3.3V)	V_{IH}: 2~3.3V, V_{IL}: 0~0.8V V_{OH}: ≥2.4V, V_{OL}≤ 0.4V

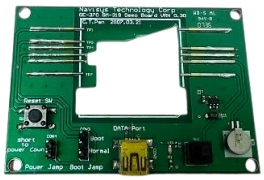
Environmental Data

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

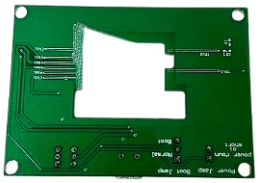
Mechanical Data



Evaluation Board:



(a) Top



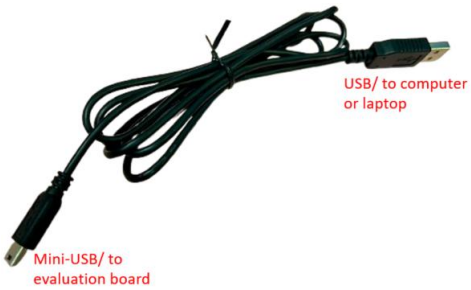
(b) Bottom



(c) GM-M71 Mounted



(d) mini-USB Connected



(e) mini-USB cable

*This document is subject to change without notice.

16-pin Interface

Pin	Name	Function	I/O
1	VCC	Power supply	Input
2	NC	No connection	-
3	V_BAT	Backup power supply	Input
4	RXD	Serial data input (into GPS)	Input
5	TXD	Serial data output (out from GPS)	Output
6	NC	No connection	-
7	NC	No connection	-
8	1PPS	1 Pulse Per Second signal	Output
9	NC	No connection	-
10	LED	LED display for position fix	Output
11	NC	No connection	-
12	GND	Ground	Input
13	NC	No connection	-
14	GND	Ground	Input
15	NC	No connection	-
16	NC	No connection	-

Ordering Information

GM-M71X

X=A	GGA, GSA, GSV, RMC, VTG; 115200bps Please specify on order if setting is different.

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