



Preliminary

Key Modules For Your Success

SkyTraq GPS Module

MG-ST01



User's Manual Ver 1.01

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1. Introduction

1.1. Overview

Modulestek GPS module **MG-ST01** is a high sensitivity ultra low power consumption cost efficient, compact size; plug & play GPS module board designed for a broad spectrum of OEM system applications. This product is based on the SkyTraq GPS technology and it will track up to 44 satellites at a time while providing fast time-to-first-fix. Its far reaching capability meets the sensitivity & accuracy requirements of car navigation as well as other location-based applications, such as AVL system. Handheld navigator, PDAs, Wrist Watches, Personal Locators, Toll collection, Fleet Management, pocket PC, or any battery operated navigation system.

The **MG-ST01** design utilizes the latest surface mount technology and high level circuit integration to achieve superior performance while minimizing dimension and power consumption. This hardware capability combined with software intelligence makes the board easy to be integrated and used in all kinds of navigation applications or products. The module communicates with application system via RS232 (TTL level) with NMEA0183 protocol.

1.2. Main Feature

- Built-in SkyTraq chipset. 44 channels “All-in-View” tracking.
- Hot start < 1sec under open sky
- Cold/Warm/Hot start time: 30/28/1 sec. (average)
- Superior sensitivity: -159 dBm for Superior urban canyon.
- Support A-GPS function.
- Reacquisition time: 0.1 sec.
- Ultra Low power consumption.(<40mA)
- Support of SBAS(WAAS / EGNOS) satellites for navigation
- Compact Size: 24.0x18.0x2.0mm, Easy integration into hand-held device.

2. Technical Specifications

GPS Features		Datum	
Chipset	Skytraq low power chipset	WGS-84	
Frequency	L1, 1575.42MHz		
C/A Code	1.023MHz chip rate	Dynamic Conditions	
Channels	Supports 44 channels	Altitude	< 18,000 m (60,000feet)
Antenna	Not Built-in	Velocity	<515 m/s (1000 knots)
		Acceleration	<4G
Sensitivity		Motional Jerk	20m/sec ³ max.
To – 159dBm Tracking, Superior Urban Canyon Performance		Interface	
		GPS Protocol: Default: NMEA-0183 - GGA, GSA, GSV, RMC, VTG	
Time to First Fix (TTFF)		Skytraq Binary	
Cold Start	30 sec, average	Data bit: 8, stop bit: 1 (Default)	
Warm Start	28 sec, average		
Hot Start	1 sec, average	Device Size and Weight	
Reacquisition	0.1 sec	24.0x18.0x3.0(mm)	
Update rate	1 Hz (std.)		
		Environmental Characteristics	
Accuracy		Operating Temperature	- 10°C to + 60°C
Position	5m CEP without SA, 10m 2D, RMS	Storage Temperature	- 20°C to + 85°C
Velocity	0.1m/sec, without SA		
Time	1µs synchronized to GPS time	Power	
		Operation Current	~40mA (Average)
		Power Input	3.3V ±5% VDC input

All specifications are subject to change without notice

3. Mechanical Dimensions

3.1. MG-ST01

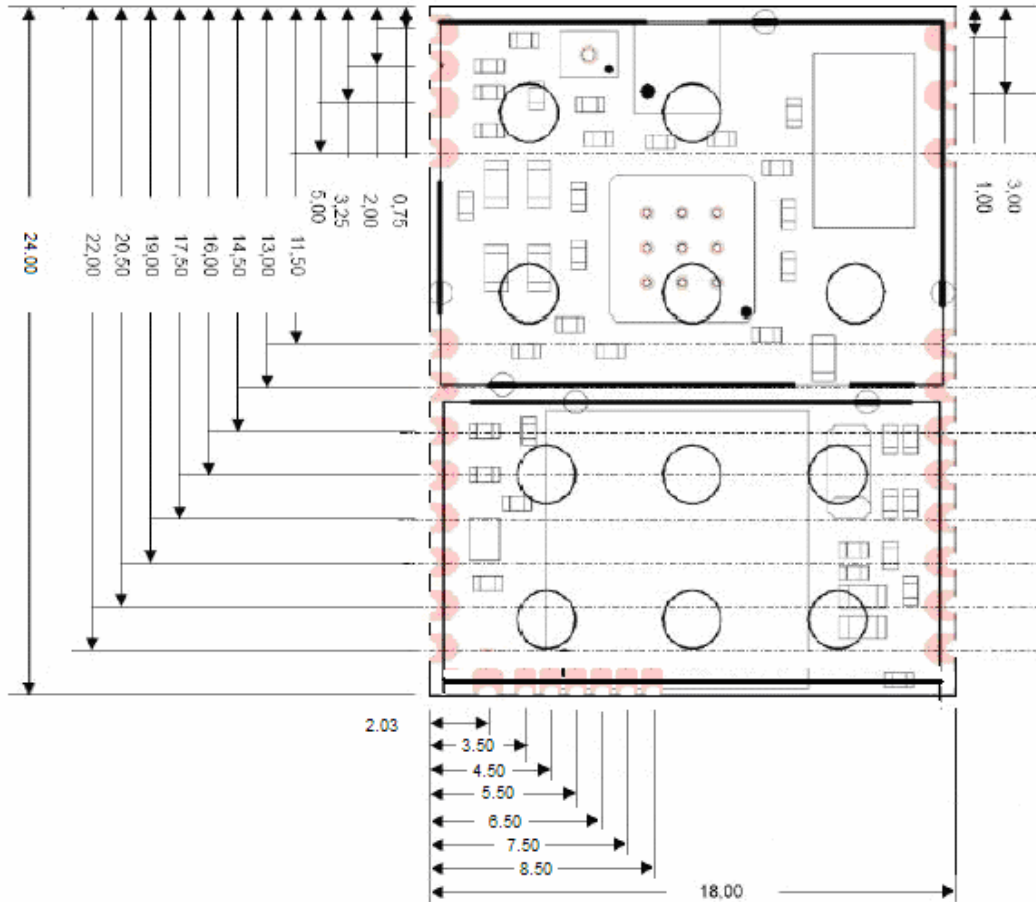


Figure 1: Board dimensions (in mm)

4. Board connections

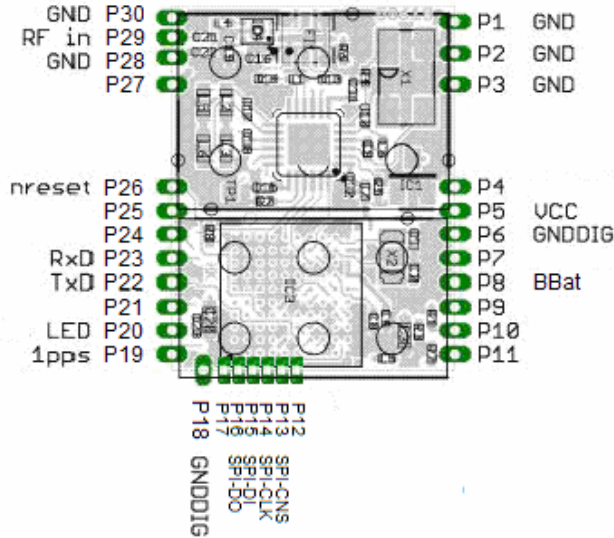


Figure 2: Board connections and placement diagram.

PIN	Voltage level	Description	PIN	Voltage level	Description
P1	GND	Analog Ground	P16	SPI-DO	SPI data output, 3.3V I/O; reserved for firmware download
P2	GND	Analog Ground	P17	NC	
P3	GND	Analog Ground	P18	GNDDIG	Digital Ground
P4	NC		P19	1PPS	Time puls signal
P5	VCC	3.3V power supply	P20	LED	
P6	GNDDIG	Digital Ground	P21	NC	
P7	NC		P22	TxD	Serial Output
P8	BBat	Backup battery supply(1.95~3.6V)	P23	RxD	Serial Input
P9~12	NC		P24~25	NC	
P13	SPI-CNS	SPI chip select, 3.3V I/O; reserved for firmware download	P26	nreset	Low level force reset
P14	SPI-CLK	SPI clock, 3.3V I/O; reserved for firmware download	P27	NC	
P15	SPI-DI	SPI data input, 3.3V I/O; reserved for firmware download	P28	GND	Analog Ground
P16	SPI-DO	SPI data output, 3.3V I/O; reserved for firmware download	P29	RF in	RF in
P17	NC		P30	GND	Analog Ground

5. Applications

MG-ST01 module board receiver is a high performance, ultra low power consumption, plug &play product. These applications are as follow.

- Car Navigation
- Wrist Watch
- Solar Operated Device
- Marine Navigation
- Fleet Management
- AVL and Location-Based Services
- Radar detector with GPS function
- Hand-Held Device for Personal Positioning and Navigation
- Ideal for PAD, Pocket PC and Other Computing Devices at GPS Application

6. Schematics

