TF-31 GPS Receiver Module

■ Main Features

- SiRF Star II/LP (low power) chipset with embedded ARM7TDMI CPU available for customized applications in firmware。
- 12 parallel satellite-tracking channels for fast acquisition and reacquisition。
- Compact size(only 30.6*26*9.8mm, include RF shield and connector)。
- High speed signal acquisition using 1920 time/frequency search channels。
- Built-in WAAS/EGNOS Demodulator。
- Low power consumption with Advanced Trickle-Power and Push-To-Fix mode。
- Optional Rechargeable battery for memory and RTC backup and for fast Time to First Fix(TTFF)。
- Support NMEA-0183 v2.2 data protocol and SiRF binary code。
- Enhanced algorithms -SnapLock and SnapStart provide superior navigation performance in urban、canyon and foliage environments。
- For Car Navigation、Marine Navigation、Fleet Management 、AVL and Location-Based Services、Auto Pilot、Personal Navigation or touring devices、Tracking devices/systems and Mapping devices application。

■ Specifications

Snap Start	< 3 sec (at < 25 minutes off period)。
Hot Start	≦8 sec(typ)。
Warm Start	≦38 sec(typ)。
Cold Start	≦45 sec(typ)。
Satellite Reacquisition	100 ms。

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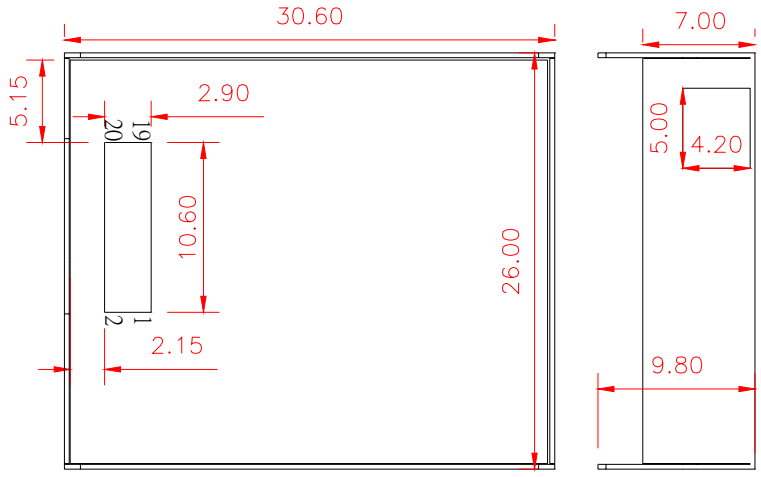
Time Accuracy	
Channels	12 satellites。
Position Accuracy	25m CEP without SA。
Receiver	L1, C/A code。
Protocol	NMEA-0183 V2.2, 4800, 8, N, 1, GGA, GSA, GSV, MC.(VTG , GLL, RMS option) or SiRF Binary。
Maximum Altitude	< 18,000 M (60,000 feet)。
Maximum Velocity	< 515 M (700knote)。
Max. Update Rate	1 Hz。
RF Connector	MMCX。
Interface	Interface connector 20-pin (2X10) low profile socket, 1mm。
Dimension	30.6mm(L)x26mm(w)x9.8mm(H)。
Weight	8g。
Firmware Upgrade	Flash memory for programming software available。
Time Mark	Output 1 pulse/sec, aligned with GPS time +/ -0.1 usec。
Operating Temperature	-40 ℃to +85 ℃。
Storage Temperature	-45 ℃to +100 ℃。
Operating Humidity	5% to 95%, No Condensing。

■ Electrical specifications：

Less than 70mA (without antenna)。

■ Output terminal and definition ：

Interface connector 20-pin (2X10) low profile socket, 1mm



Pin-out of the 20-pin digital interface connector

PIN	Name	Description
1	VCC	3.3V +/- 10% DC Power Input
2	TXA	Host Serial Data Output A
3	RXA	Host Serial Data Input A
4	TXB	Aux. Serial Data Output B
5	RXB	Aux. Serial Data Input B (DGPS)
6	TIMEMARK	1PPS Time Mark Output
7	BAT	Battery Backup Power Input
8	GPIOA	General Purpose Input/Output
9	RESET	Reset, Active Low
10	RESERVED	Reserved
11	GND	Ground
12	BOOTSEL	Internal/External Boot selective
13	GPIOB	General Purpose Input/Output
14	GPIOC	General Purpose Input/Output
15	GPIOD	General Purpose Input/Output
16	GPIOE	General Purpose Input/Output
17	GPIOF	General Purpose Input/Output
18	GPIOG	General Purpose Input/Output
19	GPIOH	General Purpose Input/Output
20	GND	Ground

※ The Host Serial Data I/O is nominally a CMOS logical high +3.3VDC.

※ The Host Serial Data Input A (Pin# 3) suggest to an active high(ex.100KΩserial to +Vcc) when not used.

VCC

Power Main Power 3.3 Vdc± 10%. Supply Current continuous, ~ 70 mA. Supply Current TricklePower mode ~ 10 mA (under determined)

TXA

This is the main transmit channel and is used to output navigation and measurement data Output is TTL Level:；Voh≧2.4V，Vol≦0.4V；Ioh=Iol=2mA.

RXA

This is the main receiver channel and is used to receive software commands to the TF31 board. Receiver is TTL Level；Vih≧0.7*VCC；Vil≦0.3*VCC

TXB

For user's application (not currently used).

RXB

This is the auxiliary receive channel and is used to input differential corrections to the TF31 board to enable DGPS navigation.. Receiver is TTL Level；Vih≧0.7*VCC；Vil≦0.3*VCC.

TIMEMARK

This pin provides one pulse-per-second output from the TMP board, which is synchronized to GPS time. This is not available in TricklePower mode.

BAT

This is the battery backup input that powers the SRAM and RTC when main power s removed. Typical current draw is 10uA.

Without an external backup battery or supercap, TF31 will execute a cold start after every power on. To achieve the faster start-up offered by a hot or warm start, either a battery backup must be connected or a supercap installed. To maximize battery lifetime, the battery voltage should not exceed the supply voltage and should be between 2.5V and 3.1V.

GPIOA - GPIOH

The pin is connected to the digital interface connector for custom applications

RESET

This pin provides an active-low reset input to the TF31 board. It causes the TF31 board to reset and start searching for satellites. If not utilized, it may be left open.

GND

GND provides the ground for the TF31 board.

BOOTSEL

Internal/External Boot selective. For normal internal boot, this pin is "High". For normal operation, the user must leave this pin disconnected.