Navilock GPS Module

Hardware Data Sheet

Product No : 60433

Version 1.0

Navilock is a brand from

Tragant Handels- und Beteiligungs GmbH

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Issue Date	APPR	CHECK	PREPARE
2014/03/24			

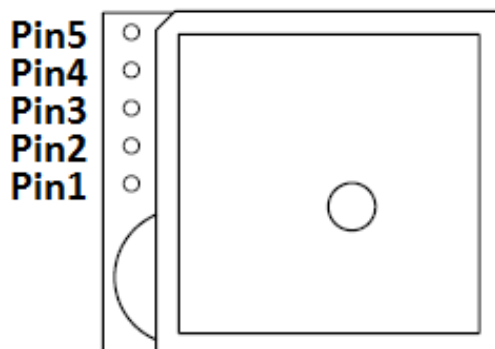# Product Description

Product Description

60433 EM-510 GPS module features high sensitivity, low power and ultra small form factor. This GPS module is powered by SiRF Star IV, it can provide you with superior sensitivity and performance even in urban canyon and dense foliage environment. With SiRF CGEE (Client Generated Extended Ephemeris) technology, it predicts satellite positions for up to 3 days and delivers CGEE-start time of less than 15 seconds under most conditions, without any network assistance. Besides, Micro Power Mode allows GPS module to stay in a hot-start condition nearly continuously while consuming very little power. 60433 EM-510 is suitable for the following applications:

- Automotive navigation
- Personal positioning
- Fleet management
- Mobile phone navigation
- Marine navigation
- Notebook navigation

Product Features

- SiRF Star IV high performance GPS Chipset
- Very high sensitivity (Tracking Sensitivity: chipset -163dBm)
- Extremely fast TTFF (Time To First Fix) at low signal level
- Support UART(bidirectional transmission) interface
- Built-in LNA
- Compact size (21.0mm x 18.0mm x 7.8mm) suitable for space-sensitive application
- Support NMEA 0183 V3.0 (GGA, GSA, GSV, RMC, VTG, GLL, ZDA)
- Support OSP protocol
- Micro Power Mode(MPM) : Reduce MPM current consumption from <500 uA to < 125 uA
- Support SBAS (WASS, EGNOS, MSAS, GAGAN, QZSS)

Product Pin Description

PIN Number(s)	Name	Type	Description	Note
1	VBAT	P	This is the battery backup power input for the SRAM and RTC when main power is off. Without the external backup battery, 60433 EM-510 will always execute a cold star after turning on. To achieve the faster start-up offered by a hot or warm start, a battery backup must be connected. The battery voltage should be between 2.0V and 3.5V.	
2	GND	P	Ground	
3	VCC	P	This is the main power supply to the engine board. (3.1Vdc to 5.0Vdc)	
4	TXD	O	This is the main transmits channel for outputting navigation and measurement data to user's navigation software or user written software. Baud rate based on SPI flash memory setting, Output TTL level referred VCC	
5	RXD	I	This is the main receive channel for receiving software commands to the engine board from SiRFdemo software or from user written software. Baud rate based on SPI flash memory setting.	

Electrical Specification

Absolute Maximums Ratings

Parameter	Min.	Typ.	Max.	Conditions	Unit
Power					
Power supply voltage(VCC)	3.1	3.3	5.0		V
Backup battery supply	2.0		3.5		V
Main power supply Current	45	50	55	GPS is not 3D Fixed.	mA
Backup battery supply Current	35	38	45	GPS is 3D Fixed.	uA

DC Electrical characteristics

Parameter	Symbol	Min.	Typ.	Max.	Conditions	Units
TXD Output Voltage	V_{TO}			VCC		V
RXD Input Voltage	V_{RI}			3.6		V
High Level Output Current	I_{OH}		2			mA
Low Level Output Current	I_{OL}		2			mA

Receiver Performance

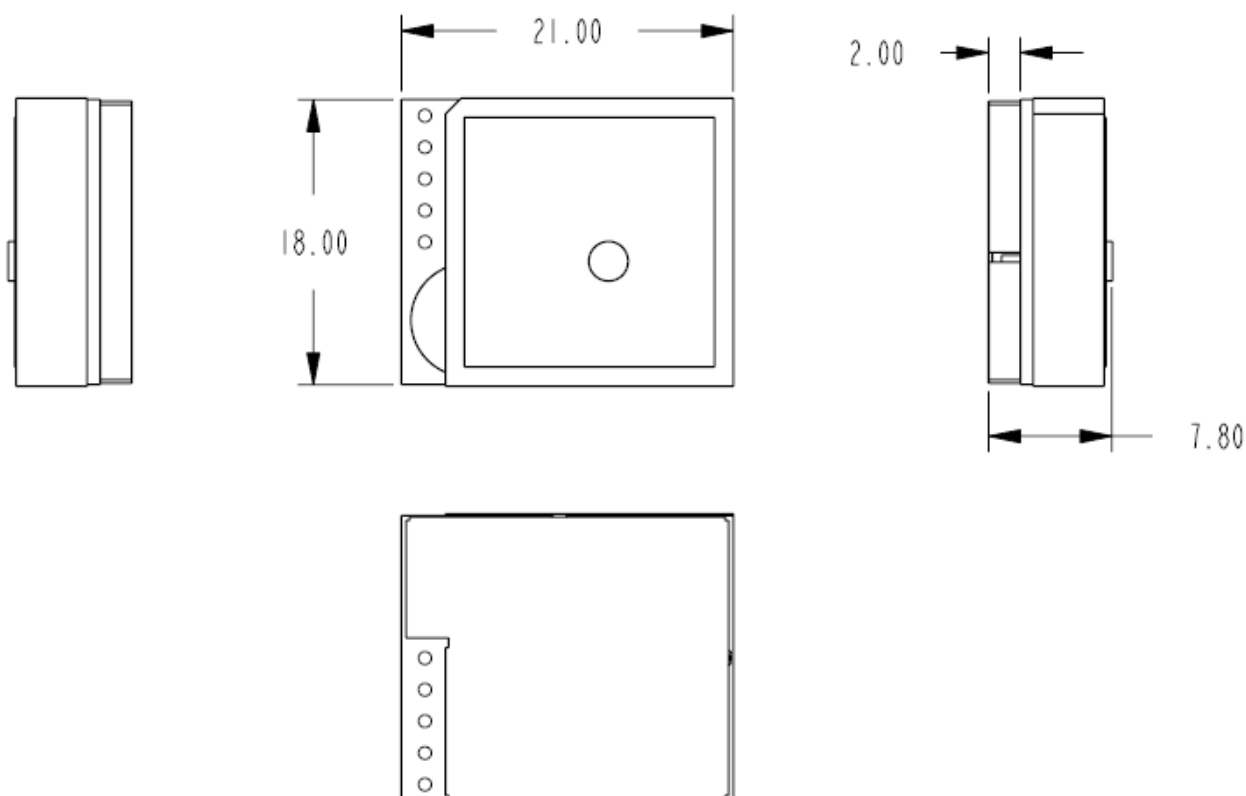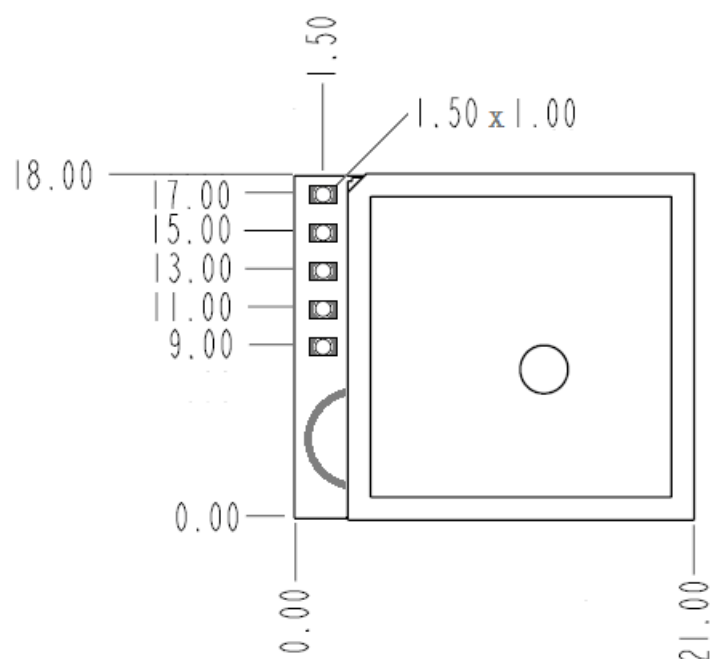|		
Sensitivity	Chipset Tracking :	-163dBm
	Chipset Autonomous acquisition :	-160 dBm
Time-To-First-Fix[1]	Cold Start – Autonomous	< 35s
		<15s (with CGEE)
	Warm Start – Autonomous[2]	< 35s
		< 15s(with CGEE)
	Hot Start – Autonomous[3]	< 1s
Horizontal Position Accuracy[4]	Autonomous	< 2.5m
Velocity Accuracy[5]	Speed	< 0.01 m/s
	Heading	< 0.01 degrees
Reacquisition	0.1 second, average	
NMEA Update Rate	Output data format based on SPI flash memory setting	
Maximum Altitude	< 18,000 meter	
Maximum Velocity	< 515 meter/ second	
Maximum Acceleration	< 4G	

<Note>

1. 50% -130dBm Fu 0.5ppm Tu ±2s Pu 30Km

2. Commanded **Warm START**

3. Commanded **Hot START**

4. 50% 24hr static, -130dBm

5. 50% @ 30m/s

Environmental Characteristics

Parameter	Min	Typ	Max	Unit
Humidity Range	5		95	% non-condensing
Operation Temperature	-40	25	85	℃
Storage Temperature	-40		85	℃

Package Dimensions

Type	5-pin holes
Dimensions	21.0 mm * 18.0 mm * 7.8 mm ±0.2mm

Brands of third parties

Brands, trade names, product names and logos of third parties mentioned in this documentation may be trademarks or registered trademarks of the respective owners.

WEEE note

The WEEE (Waste Electrical and Electronic Equipment) directive, which came into force on 13 February 2003, lead to a comprehensive change in the disposal of used electric products. It is the main purpose of this directive to avoid electric waste products (WEEE), while simultaneously promoting the re-usage, recycling and other forms of reconditioning in order to reduce the amount of waste. The WEEE logo on the product and the package shows that the product should not be disposed of with regular garbage. You are responsible for disposing all used electric and electronic devices at the corresponding collection sites. The separate collection and meaningful re-usage of electronic waste helps to deal with natural resources more economically. In addition, re-using electronic waste contributes to the preservation of the environment and human health. Additional information regarding the disposal of electric and electronic devices, their re-usage and the collection sites can be found at your local authorities, disposal companies, specialist shops and the manufacturer of the product.

RoHS conformity

This product complies with the directive 2002/95/EC of the European parliament and the council from January 27th 2003 concerning the restricted use of dangerous substances in electrical and electronical devices (RoHS) as well as its modification. This product complies with the directive 2011/65/EU from January 3rd 2013.

EU Import:

Tragant Handels- und Beteiligungs GmbH Beeskowdamm 13/15, 14167 Berlin, Germany

Reversion history

Reversion	Date	Name	Status / Comments
V1.0	2014/03/23	Reschke	