

Product name	Description	Version
LS23092-G2	Multiple GNSS mouse/ STA8088, 2m,PS2,9600BPS	1.0
LS23093-G2	Multiple GNSS mouse/ STA8088, 3m,RJ11,9600BPS	
LS23095-G2	Multiple GNSS mouse/ STA8088, 5m,PS2 with lock,9600BPS	
LS23096-G2	Multiple GNSS mouse/ STA8088, 3m,RJ11,9600BPS	

Note: LS23096-G2 is most popular. We recommend customers to use for new design.

Datasheet of GPS+GLONASS mouse, LS2309x-G2 series



LS23092-G2 LS23093-G2 LS23095-G2 LS23096-G2

1 Introduction

LS2309x-G2 series products are complete GNSS receivers (also known as GNSS mouse) based on the proven technology found in LOCOSYS GNSS module ST-1612-G that uses STMicro chip solution. The GNSS mouse will track up to 32 satellites at a time while providing fast Time-To-First-Fix, one-second navigation updates and low power consumption. It can provide you with superior sensitivity and performance even in urban canyon and dense foliage environment. Its far-reaching capability meets the sensitivity requirements of car navigation as well as other location-based applications.

2 Features

- STMicroelectronics TeseoII™ family single chip solution.
- Support GPS/GLONASS/GALILEO/QZSS navigation systems.
- Based on chips compliant with” AEC-Q100” qualification.(using STM 8088GA only)
- Manufactured complied with RoHS & ISO/TS 16949.
- Fast TTFF at low signal level.
- Capable of SBAS.
- Built-in 3-state jammer barrier.
- Support of ST-AGPS™ Multimode Assisted GPS (extended ephemeris solution)
- Build-in micro battery to reserve system data for rapid satellite acquisition.
- Magnet for mounting on the car.
- Skid resistant pad on the bottom.
- High accuracy time pulse (1PPS)

- Waterproof.

3 Application

- Personal positioning and navigation.
- Automotive navigation.
- Marine navigation.

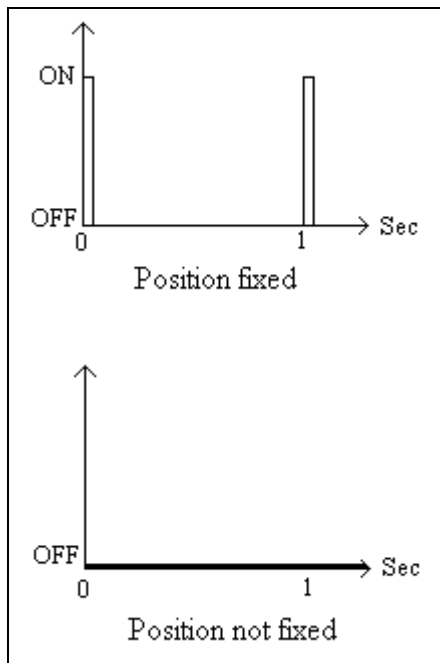
4 GNSS specification

Chip	STA8088FG series	
Frequency	GPS, GALILEO, QZSS: L1 1575.42MHz, C/A code GLONASS: L1 1598.0625MHz ~ 1605.375MHz, C/A code	
Channels	Support 32 channels	
Update rate	1Hz default, up to 10Hz.	
Acquisition Time	Cold Start (Open Sky)	32s (typical)
Position Accuracy	Autonomous	1.6m CEP
Max. Altitude	< 18,000 m (60000 ft)	
Max. Velocity	< 515 m/s (1000 knots)	
Protocol Support	NMEA 0183 ver 3.01	9600 bps ⁽¹⁾ , 8 data bits, no parity, 1 stop bits (default) 1Hz: GGA, GLL, GSA, GSV, RMC, VTG

Note 1: Both baud rate and output message rate are configurable to be factory default.

5 LED indicator

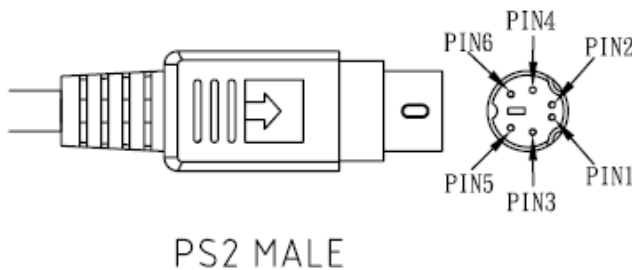
The red LED is an indicator of GNSS positioning status. In continuous power mode, it flashes once per second when position is fixed. Otherwise it is off. The timing in detail is as below.



6 Pin assignment and descriptions

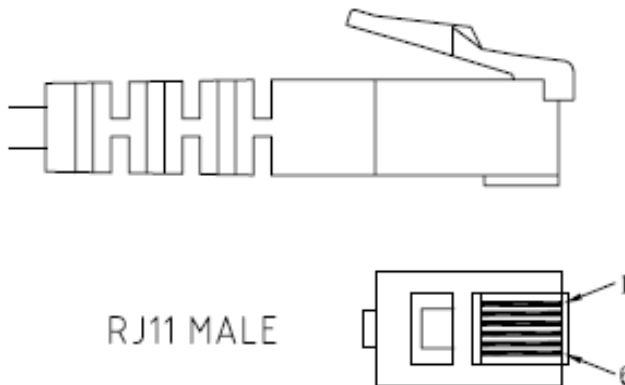
● **LS23092-G2**

Pin #	Name	Type	Description
1	GND	P	Ground
2	VDD	P	Power input
3	1PPS Output	O	1PPS output ,100ms pulse/sec
4	RX	I	Data input (RS232 level)
5	TX	O	Data output (RS232 level)
6	NC		Not connect



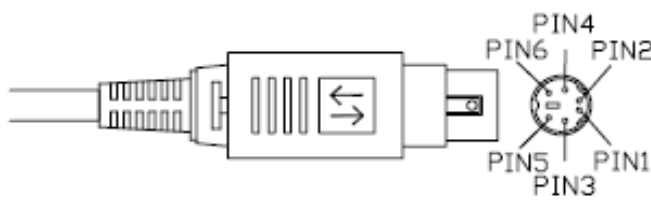
● **LS23093-G2**

Pin #	Name	Type	Description
1	VDD	P	Power input
2	RX	I	Data input (RS232 level)
3	TX	O	Data output (RS232 level)
4	GND	P	Ground
5	1PPS Output	O	1PPS output ,100ms pulse/sec
6	NC		Not connect



● **LS23095-G2**

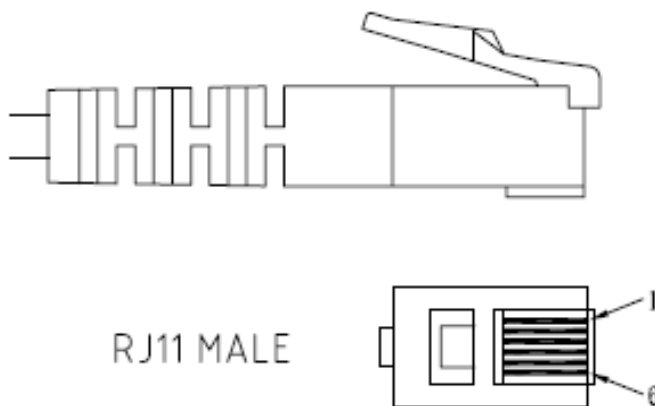
Pin #	Name	Type	Description
1	VDD	P	Power input
2	GND	P	Ground
3	1PPS Output	O	1PPS output ,100ms pulse/sec
4	TX	O	Data output (RS232 level)
5	RX	I	Data input (RS232 level)
6	NC		Not connect



PS2 MALE
with lock

● **LS23096-G2**

Pin #	Name	Type	Description
1	1PPS Output	O	1PPS output ,100ms pulse/sec
2	GND	P	Ground
3	RX	I	Data input (RS232 level)
4	TX	O	Data output (RS232 level)
5	VDD	P	Power input
6	NC		Not connect



RJ11 MALE

7 DC & Temperature characteristics

7.1 Power consumption (continuous mode)

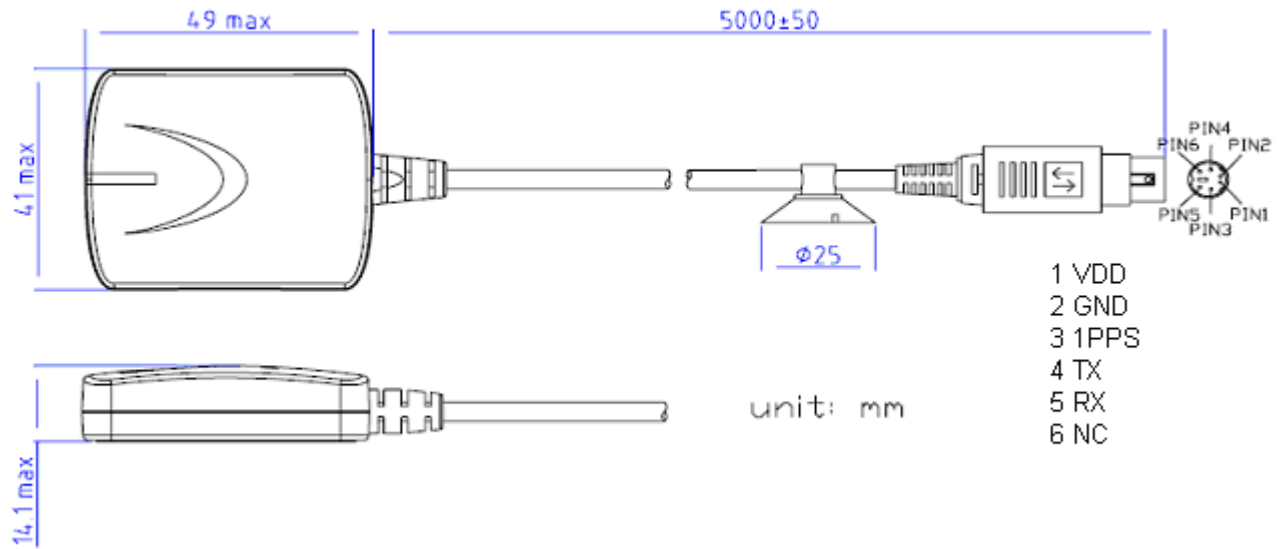
Parameter	Symbol	Product	Min.	Typ.	Max.	Units
Input voltage	VCC	LS23092-G2	4	5	6	V
		LS23093-G2				
		LS23095-G2				
		LS23096-G2				
Input current	Icc	LS23092-G2		56 ⁽¹⁾		mA
		LS23093-G2				
		LS23095-G2				
		LS23096-G2				

1. Measured when position fix (1Hz) is available.

7.2 Temperature characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units
Operating Temperature	Topr	-40	-	85	°C
Storage Temperature	Tstg	-40	-	85	°C

● **LS23095-G2 (RS232 interface)**



● **LS23096-G2 (RS232 interface)**

