GPS/GNSS Receiver (G-Mouse)

1. Product Information

Product Name: GPS93030S

Product Description:

GPS93030S Series is a compact, high performance, and low power consumption G-Mouse.

It uses the chipset which can track up to 56 channels at a time and perform fast TTFF in weak signal environments.

GPS93030S is suitable for the following applications:

- Automotive navigation
- Personal positioning
- Fleet management
- Marine navigation

Product Features:

- High performance and low power consumption GNSS Chipset
- Very high sensitivity
- Extremely fast TTFF (Time To First Fix) at low signal level
- Two serial ports
- Support NMEA 0183 and ublox binary protocol

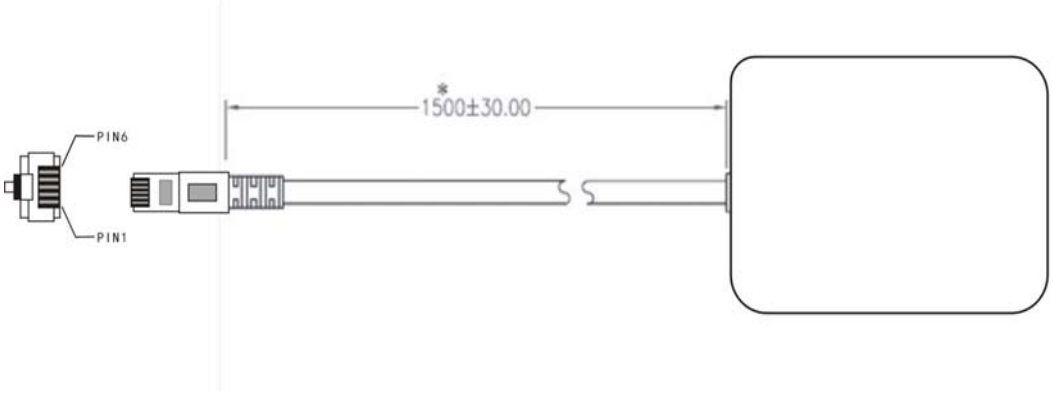
Product Specifications

GPS Performance

GPS Receiver	
Frequency	L1 frequency band
Code	C/A Code
Protocol	NMEA 0183 v4.1 GALILEO L1 open service (with upgrade) Default:GGA,GSA,GSV,RMC Support:VTG,GLL,TXT ublox binary and NMEA Command
Available Baud Rate	9,600 bps
Channels	56
Sensitivity	Tracking:-161dBm Reacquisition:-160dBm ColdStart:-147dBm
Cold Start	29 seconds, average
Warm Start	28 seconds, average
Hot Start	1 second, average
Accuracy	HorizontalPosition:Autonomous<2.5maverage, SBAS < 2.0m average Velocity: 0.1 m/s Timepulse signal: RMS 30 ns
Maximum Altitude	50,000 meter
Maximum Velocity	515 m/s(1000 knots)
Dynamics	≦ 4G
Update Rate	4 Hz
A-GPS	AssistNow on-line and off-line
Physical Characteristic	
Dimensions	50.0mm * 39.0 mm * 19.0mm
Environmental Range	
Humidity Range	5% to 95% non-condensing
Operation Temperature	-40℃ to 85℃
Storage Temperature	-40℃ to 85℃

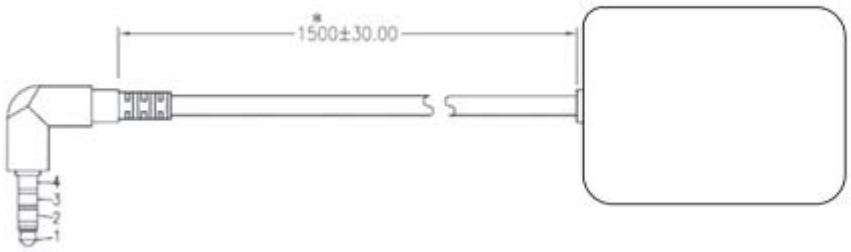
2. Physical Dimension (be Custom Welcome)

GPS93030SRJ45



Pin	Pin define	Level
1	**NC**	
2	**GND**	Ground
3	**RXD**	TTL input/ RS232
4	**TXD**	TTL output/ RS232
5	**VCC**	3.0—5Vdc
6	**NC**	

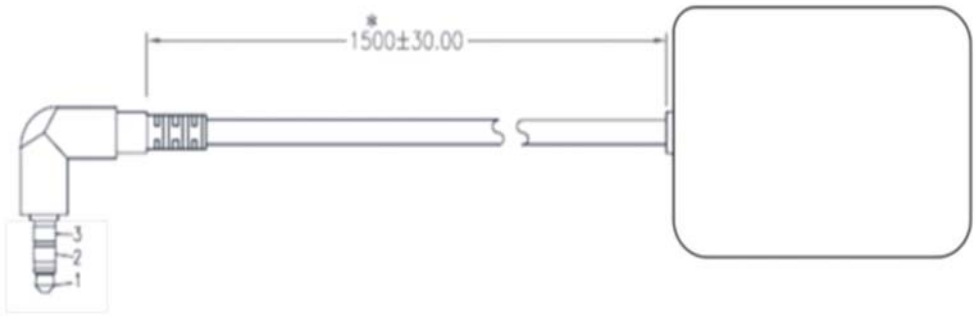
GPS93030SE25
GPS93030SE35



IO Interface	Voltage level
4 pin 2.5/3.5mmEarphone Jack	UART(TTL level)

Pin	Pin define	Level
1	**VCC**	3.0—5Vdc
2	**RXD**	TTL input/ RS232
3	**TXD**	TTL output/ RS232
4	**GND**	Ground

GPS93030SE253
GPS93030SE353



IO Interface	Voltage level
3 pin 2.5/3.5mmEarphone Jack	UART(TTL level)

Pin	Pin define	Level
1	**VCC**	3.6—5.5V Dc
2	**TXD**	TTL output/ RS232
3	**GND**	Ground

3.NMEA 0183 Protocol

The NMEA protocol is an ASCII-based protocol, Records start with a $ and with carriage return/line feed. GPS specific messages all start with $GPxxx where xxx is a three-letter identifier of the message data that follows. NMEA messages have a checksum, which allows detection of corrupted data transfers.

YIC93030S Series modules support the following NMEA-0183 messages: GGA, GLL,GSA, GSV, RMC and VTG.

Table 3. 1: NMEA-0183 Output Messages

NMEA Record	DESCRIPTION
GGA	Global positioning system fixed data
GLL	Geographic position—latitude/longitude
GSA	GNSS DOP and active satellites
GSV	GNSS satellites in view
RMC	Recommended minimum specific GNSS data
VTG	Course over ground and ground speed

GGA-Global Positioning System Fixed Data

Table4. 2 contains the values of the following example:

$GPGGA, 161229.487,3723.24751,N, 12158.34160,W, 1,07,1.0,9.0,M.0000*18

Table3. 2: GGA Data Format

Name	Example	Units	Description
Message ID	$GPGGA		GGA protocol header
UTC Position	161229.487		hhmmss.sss
Latitude	3723.24571		ddmm.mmmmm
N/S indicator	N		N=north or S=south
Longitude	12158.34160		ddmm.mmmmm
E/W Indicator	W		E=east orW=west
Position Fix Indicator	1		See Table 2-1
Satellites Used	07		Range 0 to 12
HDOP	1.0		Horizontal Dilution of Precision
MSLAltitude	9.0	meters	
Units	M	meters	
Geoids Separation		meters	
Units	M	meters	
Age of Diff.Corr.		second	Null fields when DGPS is not Used
Diff.Ref.Station ID	0000		
Checksum	*18		
<CR> <LF>			End of message termination

Table 3.2.1: Position Fix Indicators

Value	Description
0	Fix not available or invalid
1	GPS SPS Mode, fix valid
2	Differential GPS, SPS Mode, fix valid
3	GPS PPS Mode, fix valid

GLL-Geographic Position – Latitude/Longitude

Table3. 3 contains the values of the following example:

$GPGLL , 3723.24755, N,12158.34161,W,161229.487, A*2C.

Table3. 3: GLL Data Format

Name	Example	Units	Description
Message ID	$GPGLL		GLL protocol header
Latitude	3723.24755		Ddmm.mmmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.34161		ddmm.mmmmm
E/W Indicator	W		E=east orW=west
UTC Position	161229.487		Hhmmss.sss
Status	A		A=data valid or V=data not valid
Checksum	*2C		
<CR> <LF>			End of message temination

GSA-GNSS DOP and Active Satellites

Table3. 4 contains the values of the following example:

$GPGSA , A, 3, 07, 02, 26,27, 09, 04,15, , , , , , 1.8,1.0,1.5*33.

Table3. 4: GSA Data Format

Name	Example	Units	Description
Message ID	$GPGSA		GSA protocol header
Mode 1	A		See Table 4-2
Mode 2	3		See Table 4-1
Satellite Used	07		Sv on Channel 1
Satellite Used	02		Sv on Channel 2
…	…		…
Satellite Used			Sv on Channel 12
PDOP	1.8		Position Dilution of Precision
HDOP	1.0		Horizontal Dilution of Precision
VDOP	1.5		Vertical Dilution of Precision
Checksum	*33		
<CR> <LF>			End of message termination

Table3. 4.1: Mode 1

Value	Description
1	Fix not available
2	2D
3	3D

Table 3.4.2: Mode 2

Value	Description
M	Manual-forced to operate in 2D or 3D mode
A	Automatic-allowed to automatically switch 2D/3D

GSV-GNSS Satellites in View

Table3. 5 contains the values of the following example:

$GPGSV , 2, 1, 07, 07, 79,048, 42, 02, 51,062, 43, 26, 36,256, 42, 27, 27, 138,42*71

$GPGSV, 2, 2, 07, 09, 23,313, 42, 04, 19, 159, 41, 15,12,041, 42*41.

Table3. 5: GGA Data Format

Name	Example	Units	Description
Message ID	$GPGSV		GSV protocol header
Number of Message	2		Range 1 to 3
Message Number	1		Range 1 to 3
Satellites in View	07		
Satellite ID	07		Channel 1(Range 1 to 32)
Elevation	79	degrees	Channel 1(Maximum 90)
Azinmuth	048	degrees	Channel 1(True, Range 0 to 359)
SNR(C/NO)	42	dBHz	Range 0 to 99,null when not tracking
…			…
Satellite ID	27		Channel 4(Range 1 to 32)
Elevation	27	degrees	Channel 4(Maximum 90)
Azimuth	138	degrees	Channel 4(True, Range 0 to 359)
SNR(C/NO)	42	dBHz	Range 0 to 99, null when not tracking
Checksum	*71		
<CR> <LF>			End of message termination

Depending on the number of satellites tracked multiple messages of GSV data may be required

RMC-Recommended Minimum Specific GNSS Data

Table3. 6 contains the values of the following example:

$GPRMC, 161229.487, A, 3723.24751, N, 12158.34161,W, 0.13,309.62, 120598,, *10

Table3. 6: RMC Data Format

Name	Example	Units	Description
Message ID	$GPRMC		RMC protocol header
UTS Position	161229.487		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	3723.24751		ddmm.mmmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.34161		Ddmm.mmmmm
E/W Indicator	W		E=east orW=west
Speed Over Ground	0.13	Knots	
Course Over	309.62	Degrees	True
Ground			
Date	120598		Dummy
Magnetic variation		Degrees	E=east or W=west
Checksum	*10		
<CR> <LF>			End of message termination

VTG-Course Over Ground and Ground Speed

Table3. 7 contains the values of the following example:

$GPVTG, 309.62, T, M, 0.13, N, 0.2, K*6E

Table 3,7: VTG Data Format

Name	Example	Units	Description
Message ID	$GPVTG		VTG protocol header
Course	309.62	Degrees	Measured heading
Reference	T		True
Course		Degrees	Measured heading
Reference	M		Magnetic
Speed	0.13	Knots	Measured horizontal speed
Units	N		Knots
Speed	0.2	Km/hr	Measured horizontal speed
Units	K		Kilometer per hour
Checksum	K		Kilometer per hour
Date	*6E		
<CR> <LF>			End of message termination