

MiniGMouse-PS2

(MGP-81)



The document is the exclusive property of GlobalTop Tech Inc. and should not be distributed, reproduced, or any other format without prior permission of GlobalTop Tech Inc. Specifications subject to change without prior notice

GlobalTop Tech Inc.

3rd Floor., No.7 Nan-ke 3rd Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com
Copyright© 2007 GlobalTop Tech Inc. All right reserved.



History

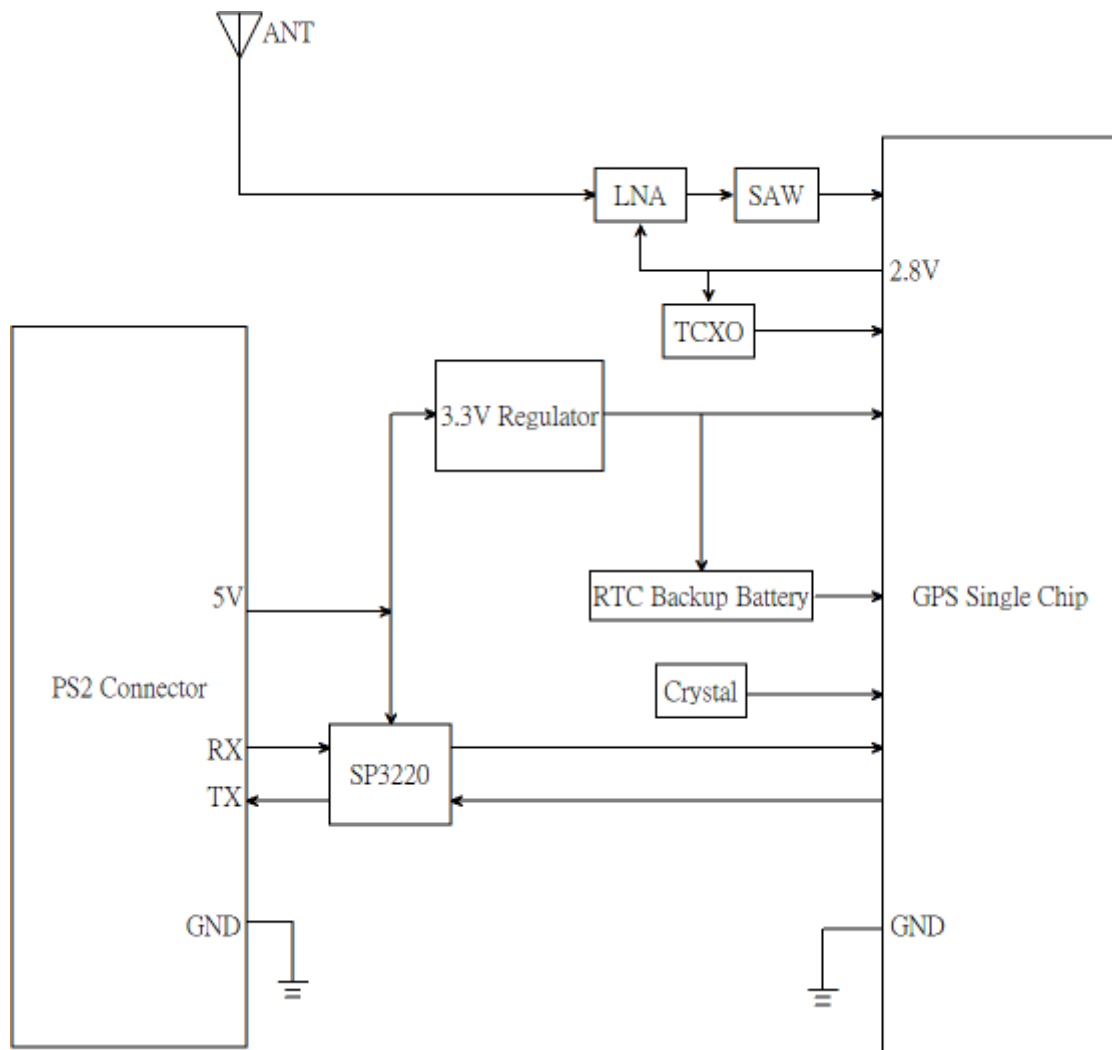
History		
Date	Rev.	Description
2008/06/11	A00	First Release (preliminary)
2008/12/16	A01	Second Release (preliminary)
2009/02/02	A02	1.Modify update rate show (preliminary) 2.Modify baud rate show
2009/03/30	A03	Formally Release Page 5: Update Mechanical picture Page 6 : Remove cable customization
2009/05	A04	Page 5: Add LED status description Page 8: Add NMEA protocol for reference

The document is the exclusive property of GlobalTop Tech Inc. and should not be distributed, reproduced, or any other format without prior permission of GlobalTop Tech Inc. Specifications subject to change without prior notice

GlobalTop Tech Inc.

3rd Floor., No.7 Nan-ke 3rd Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com
Copyright© 2007 GlobalTop Tech Inc. All right reserved.

System Block



The document is the exclusive property of GlobalTop Tech Inc. and should not be distributed, reproduced, or any other format without prior permission of GlobalTop Tech Inc. Specifications subject to change without prior notice

GlobalTop Tech Inc.

3rd Floor., No.7 Nan-ke 3rd Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com
Copyright© 2007 GlobalTop Tech Inc. All right reserved.



Description

The miniGMouse-PS2 is a GPS module. It is a GPS receiver providing a solution that high position and speed accuracy performances as well as high sensitivity and tracking capabilities in urban conditions. The GPS chipsets inside the module are designed by **MediaTek Inc.**, which is the world's leading digital media solution provider and largest fab-less IC company in Taiwan. The module can support up to **66 channels**. The GPS solution enables small form factor devices. They deliver major advancements in GPS performances, accuracy, integration, computing power and flexibility. They are designed to simplify the embedded system integration process. The module is the best choice for you to design the GPS related products.

Features

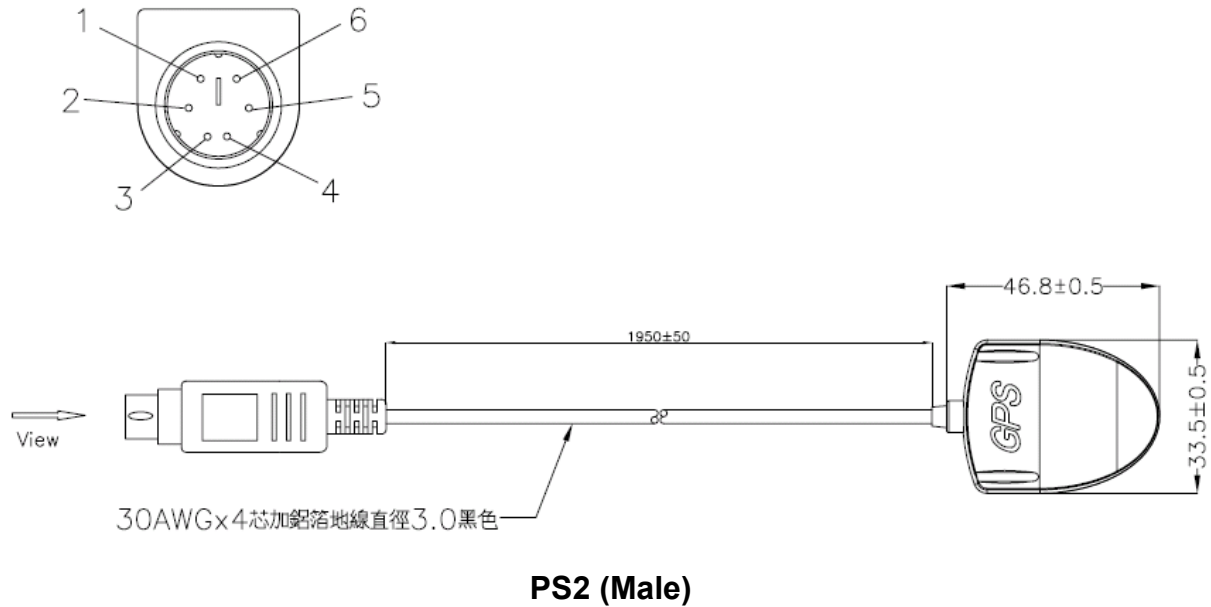
- ⊕ L1 frequency, C/A code, 66-channel
- ⊕ Embedded LNA and SAW filter
- ⊕ High sensitivity : Up to -163dBm tracking, superior urban performance
- ⊕ Position accuracy : < 3m CEP (50%) without SA (horizontal)
- ⊕ Cold Start is Under 35 seconds (Typical)
- ⊕ Warm Start is Under 34 seconds (Typical)
- ⊕ Low power consumption : 48mA@ acquisition, 38mA@ tracking
- ⊕ DGPS(WAAS, EGNOS, MSAS) support (optional by firmware)
- ⊕ Update rate : 1Hz
- ⊕ RoHS compliant

The document is the exclusive property of GlobalTop Tech Inc. and should not be distributed, reproduced, or any other format without prior permission of GlobalTop Tech Inc. Specifications subject to change without prior notice

GlobalTop Tech Inc.

3rd Floor., No.7 Nan-ke 3rd Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com
Copyright© 2007 GlobalTop Tech Inc. All right reserved.

Mechanical



Pin Configuration

Pin	Description	Internal wire color
1	TX(RS232)	Orange
2	NC	
3	+5VDC	Brown
4	GND	Black
5	RX(RS232)	White
6	NC	

LED Status:

Led Indicator	Description
GPS positioning status	On : GPS Inquiring Blinking: GPS Positioning fix

The document is the exclusive property of GlobalTop Tech Inc. and should not be distributed, reproduced, or any other format without prior permission of GlobalTop Tech Inc. Specifications subject to change without prior notice

GlobalTop Tech Inc.

3rd Floor., No.7 Nan-ke 3rd Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com
Copyright© 2007 GlobalTop Tech Inc. All right reserved.



Specification

General	
Chipset	MTK MT3329
Frequency	L1, 1575.42MHz
C/A Code	1.023 MHz
Channels	66 channels
SBAS	WAAS, EGNOS, GAGAN,MSAS Supported
Datum	WGS84(Default), Tokyo-M, Tokyo-A, User Define
Dimensions	
Length/Width/Height	46(L)x33(W)x17.3(H)mm, without cable
Cable Length	2m
Performance Characteristics	
Position Accuracy	Without aid : 3.0m 2D-RMS
	< 3m CEP (50%) without SA (horizontal)
	DGPS (RTCM, SBAS (WAAS, EGNOS, MSAS)) : 2.5m
Velocity Accuracy	Without aid : 0.1 m/s
	DGPS (RTCM, SBAS (WAAS, EGNOS, MSAS)) : 0.05m/s
Acceleration Accuracy	Without aid : 0.1 m/s ²
	DGPS (RTCM, SBAS (WAAS, EGNOS, MSAS)) : 0.05m/s ²
Timing Accuracy	100 ns RMS
Sensitivity	Acquisition : -148dBm (Cold Start)
	Reacquisition : -157dBm
	Tracking : -163dBm
Update Rate	1Hz(Default)
Acquisition (Open sky, stationary)	
Reacquisition Time	Less than 1 second
Hot start	1.0s (Typical)
Warm start	34s (Typical)

The document is the exclusive property of GlobalTop Tech Inc. and should not be distributed, reproduced, or any other format without prior permission of GlobalTop Tech Inc. Specifications subject to change without prior notice

GlobalTop Tech Inc.

3rd Floor., No.7 Nan-ke 3rd Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com
Copyright© 2007 GlobalTop Tech Inc. All right reserved.



MiniGMouse-PS2 MGP-81 Datasheet

Rev.A04

Cold start	35s (Typical)
Dynamic	
Altitude	Maximum 18,000m
Velocity	Maximum 515m/s
Acceleration	Maximum 4G
Power	
Input Voltage	DC 5.0V \pm 5%
Power Consumption @ 5.0V	Acquisition : 48mA Typical
	Tracking : 38mA Typical
I/O	
Signal Output	8 data bits, no parity, 1 stop bit
Baud Rates	9600bps (4800/38400/57600/115200 bps by option)
Protocols	NMEA 0183 v3.01 (Default : GGA,GSA,GSV,RMC,VTG) RTCM MTK NMEA Command
Environment	
Operating Temperature	-40 °C to 85 °C (without coin battery)
	-20 °C to 60 °C (with coin battery)
Storage Temperature	-50°C to 90 °C (without coin battery)
	-20°C to 60 °C (with coin battery)
Operating Humidity	5% to 95% (no condensing)

The document is the exclusive property of GlobalTop Tech Inc. and should not be distributed, reproduced, or any other format without prior permission of GlobalTop Tech Inc. Specifications subject to change without prior notice

GlobalTop Tech Inc.

3rd Floor., No.7 Nan-ke 3rd Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com
Copyright© 2007 GlobalTop Tech Inc. All right reserved.



NMEA Output Sentence

Table-1 lists each of the NMEA output sentences specifically developed and defined by MTK for use within MTK products

NMEA Output Sentence		Table-1
Option	Description	
GGA	Time, position and fix type data.	
GSA	GPS receiver operating mode, active satellites used in the position solution, and DOP values.	
GSV	The number of GPS satellites in view satellite ID numbers, elevation, azimuth, and SNR values.	
RMC	Time, date, position, course and speed data. Recommended Minimum Navigation Information.	
VTG	Course and speed information relative to the ground.	

The document is the exclusive property of GlobalTop Tech Inc. and should not be distributed, reproduced, or any other format without prior permission of GlobalTop Tech Inc. Specifications subject to change without prior notice

GlobalTop Tech Inc.

3rd Floor., No.7 Nan-ke 3rd Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com
Copyright© 2007 GlobalTop Tech Inc. All right reserved.



GGA—Global Positioning System Fixed Data. Time, Position and fix related data for a GPS receiver

Table-2 contains the values for the following example :

\$GPGGA,064951.000,2307.1256,N,12016.4438,E,1,8,0.95,39.9,M,17.8,M,,*65

GGA Data Format			Table-2
Name	Example	Units	Description
Message ID	\$GPGGA		GGA protocol header
UTC Time	064951.000		hhmmss.sss
Latitude	2307.1256		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12016.4438		dddmm.mmmm
E/W Indicator	E		E=east or W=west
Position Fix Indicator	1		See Table-3
Satellites Used	8		Range 0 to 14
HDOP	0.95		Horizontal Dilution of Precision
MSL Altitude	39.9	meters	Antenna Altitude above/below mean-sae-level
Units	M	meters	Units of antenna altitude
Geoidal Separation	17.8	meters	
Units	M	meters	Units of geoidal separation
Age of Diff. Corr.		second	Null fields when DGPS is not used
Checksum	*65		
<CR> <LF>			End of message termination

Position Fix Indicator		Table-3
Value	Description	
0	Fix not available	
1	GPS fix	
2	Differential GPS fix	

The document is the exclusive property of GlobalTop Tech Inc. and should not be distributed, reproduced, or any other format without prior permission of GlobalTop Tech Inc. Specifications subject to change without prior notice

GlobalTop Tech Inc.

3rd Floor., No.7 Nan-ke 3rd Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com
Copyright© 2007 GlobalTop Tech Inc. All right reserved.



GSA—GNSS DOP and Active Satellites

Table-4 contains the values for the following example :

\$GPGSA,A,3,29,21,26,15,18,09,06,10,,,,,2.32,0.95,2.11*00

GSA Data Format				Table-4
Name	Example	Units	Description	
Message ID	\$GPGSA		GSA protocol header	
Mode 1	A		See Table-5	
Mode 2	3		See Table-6	
Satellite Used	29		SV on Channel 1	
Satellite Used	21		SV on Channel 2	
....	
Satellite Used			SV on Channel 12	
PDOP	2.32		Position Dilution of Precision	
HDOP	0.95		Horizontal Dilution of Precision	
VDOP	2.11		Vertical Dilution of Precision	
Checksum	*00			
<CR> <LF>			End of message termination	

Mode 1		Table-5
Value	Description	
M	Manual—forced to operate in 2D or 3D mode	
A	2D Automatic—allowed to automatically switch 2D/3D	

Mode 2		Table-6
Value	Description	
1	Fix not available	
2	2D (< 4 SVs used)	
3	3D (\geq 4 SVs used)	

The document is the exclusive property of GlobalTop Tech Inc. and should not be distributed, reproduced, or any other format without prior permission of GlobalTop Tech Inc. Specifications subject to change without prior notice

GlobalTop Tech Inc.

3rd Floor., No.7 Nan-ke 3rd Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com
Copyright© 2007 GlobalTop Tech Inc. All right reserved.



GSV—GNSS Satellites in View

Table-7 contains the values for the following example :

\$GPGSV,3,1,09,29,36,029,42,21,46,314,43,26,44,020,43,15,21,321,39*7D

\$GPGSV,3,2,09,18,26,314,40,09,57,170,44,06,20,229,37,10,26,084,37*77

\$GPGSV,3,3,09,07,,,26*73

GSV Data Format			Table-7
Name	Example	Units	Description
Message ID	\$GPGSV		GSV protocol header
Number of Messages	3		Range 1 to 3 <i>(Depending on the number of satellites tracked, multiple messages of GSV data may be required.)</i>
Message Number1	1		Range 1 to 3
Satellites in View	09		
Satellite ID	29		Channel 1 (Range 1 to 32)
Elevation	36	degrees	Channel 1 (Maximum 90)
Azimuth	029	degrees	Channel 1 (True, Range 0 to 359)
SNR (C/No)	42	dBHz	Range 0 to 99, (null when not tracking)
....
Satellite ID	15		Channel 4 (Range 1 to 32)
Elevation	21	degrees	Channel 4 (Maximum 90)
Azimuth	321	degrees	Channel 4 (True, Range 0 to 359)
SNR (C/No)	39	dBHz	Range 0 to 99, (null when not tracking)
Checksum	*7D		
<CR> <LF>			End of message termination

The document is the exclusive property of GlobalTop Tech Inc. and should not be distributed, reproduced, or any other format without prior permission of GlobalTop Tech Inc. Specifications subject to change without prior notice

GlobalTop Tech Inc.

3rd Floor., No.7 Nan-ke 3rd Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com
Copyright© 2007 GlobalTop Tech Inc. All right reserved.



RMC—Recommended Minimum Navigation Information

Table-8 contains the values for the following example :

\$GPRMC,064951.000,A,2307.1256,N,12016.4438,E,0.03,165.48,260406,,,A*55

RMC Data Format			Table-8
Name	Example	Units	Description
Message ID	\$GPRMC		RMC protocol header
UTC Time	064951.000		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	2307.1256		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12016.4438		dddmm.mmmm
E/W Indicator	E		E=east or W=west
Speed Over Ground	0.03	knots	
Course Over Ground	165.48	degrees	True
Date	260406		ddmmyy
Magnetic Variation		degrees	E=east or W=west <i>(MTK does support magnetic declination)</i>
Mode	A		A= Autonomous mode D= Differential mode E= Estimated mode
Checksum	*65		
<CR> <LF>			End of message termination

The document is the exclusive property of GlobalTop Tech Inc. and should not be distributed, reproduced, or any other format without prior permission of GlobalTop Tech Inc. Specifications subject to change without prior notice

GlobalTop Tech Inc.

3rd Floor., No.7 Nan-ke 3rd Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com
Copyright© 2007 GlobalTop Tech Inc. All right reserved.



VTG—Course and speed information relative to the ground.

Table-9 contains the values for the following example :

\$GPVTG,165.48,T,,M,0.03,N,0.06,K,A*37

VTG Data Format			Table-9
Name	Example	Units	Description
Message ID	\$GPVTG		VTG protocol header
Course	165.48	degrees	Measured heading
Reference	T		True
Course		degrees	Measured heading
Reference	M		Magnetic <i>(MTK does not support magnetic declination.)</i>
Speed	0.03	knots	Measured horizontal speed
Units	N		Knots
Speed	0.06	km/hr	Measured horizontal speed
Units	K		Kilometers per hour
Mode	A		A= Autonomous mode D= Differential mode E= Estimated mode
Checksum	*06		
<CR> <LF>			End of message termination

MTK NMEA Command Protocol

Packet Type :

103 PMTK_CMD_COLD_START

Packet Meaning :

Cold Start : Don't use Time, Position, Almanacs and Ephemeris data at re-start.

Example :

\$PMTK103*30<CR><LF>

The document is the exclusive property of GlobalTop Tech Inc. and should not be distributed, reproduced, or any other format without prior permission of GlobalTop Tech Inc. Specifications subject to change without prior notice

GlobalTop Tech Inc.

3rd Floor., No.7 Nan-ke 3rd Rd Science-based Ind. Park, Tainan 741-47, Taiwan, R.O.C.
Tel:+886-6-6007799 Fax:+886-6-5053381 <http://www.gtop-tech.com/> email: sales@gtop-tech.com
Copyright© 2007 GlobalTop Tech Inc. All right reserved.