YXT-105M10

GPS/Beidou/Galileo/GLONASS/ G-MOUSE

GNSS Positioning Module Data Sheet

March, 2022

revision history

Version number	revision history	date
Ver1.00	Initially established	May 2022

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YXT-105M10

G-MOUSE

Data Sheet **v1.00**

G-MOUSE

1. Product description

product name: YXT-105M10

YXT-105M10 is a high-performance positioning G-MOUSE oriented to the field of vehiclein tegrated navigation. This product uses UBLOX M10050-KB low-power chip and supports receiving up to four global navigation satellite systems (GPS, GLONASS, Galileo and BeiD). The large number of visible satellites enables the receiver to select the best signal. This maximizes positioning accuracy, especially in challenging conditions, and is fully functional to meet the stringent requirements of professional positioning. Small size, integrated flash, support to modify and save parameters, accurate positioning, such as fast positioning in harsh environments such as deep urban canyons. It is widely used in car navigation, car security system, vehicle monitoring, unmanned flight control, automatic driving and other fields, and is also widely used in the development of various GPS terminal products.

Module Appearance:

2. Product application

- GPS is used in PDAs, pocket PCs and other portable devices
- Trajectory tracking products such as personal positioning and car positioning
- Area measurement and distance measurement and other surveying and mapping products, mu measuring instrument
- Law enforcement recorders, driving recorders, advertising machines, external antennas and other products
- Trajectory recording and GPS/Beidou data point calibration and other products

3. Product highlights

- The industry-standard 25*25*4MM high-sensitivity GPS antenna can also support active antennas
- 0.5PPM high-precision TCXO is adopted
- Built-in RTC crystal and pico-capacitor for faster hot start
- Built-in LNA, low noise signal amplifier
- Using UBLOX 10050-KB chip, support warm start
- With flash, support 0.25-10Hz positioning update rate modification and saving
- Support for A-GPS services such as AssistNowOnline and AssistNowOfflineService
- GPS, BEIDOU, GLUONASS, GALILEO (WAAS, EGNOS, MSAS, GAGAN) hybrid engines

4. Technical characteristics

product performance		
project	**illustrate**	**Product parameters**
Chip Features	chip	UBX-M10050
	frequency	GPS L1 C/A，GLONASS L1 C/A，BDS B1I/B1C，GALILEO E1 B/C，SBAS L1 C/A ,QZSS L1 C/A, SBAS
	baud rate	4800bps-921600bps(default 38400bps)
	passage	99CH
sensitivity	trace	-167dBm
	catch	-160dBm
	cold boot	-149dBm
Startup time	cold boot	average 28 seconds
	Warm start	average 25 seconds
	warm boot	Average 1 second
precision	Horizontal accuracy	1.5m CEP 2D RMS SBAS assisted (open sky)
	Time accuracy	19 ns
Work restrictions	Maximum height	80000M
	Maximum speed	505 m/s
	Maximum acceleration	≦ 4G
Output data	Output level	TTL level / compatible with RS232 interface
	Output protocol	NMEA0183 standard protocol/UBX
	Update frequency	0.25-10 Hz (default 1Hz)
Physical characteristics	Form factor	30.2 x 26.2 x 7.4mm
	weight	11.8 grams
Working environment	Operating temperature	-40℃ to 85℃
	Storage temperature	-55℃ to 105℃
	PPS lamps	Before positioning, the PPS light is off, and after positioning is successful, the PPS light flashes

5. Module size:

size：30.1mm*26.2mm*7.4mm

6. Interface description and function introduction

PIN function

name	describe
P	GND, ground.
M	USB interface, D+, (NEO-7M/8M module support, M10 does not support USB function)
D	USB interface, D-, (NEO-7M/8M module support, M10 does not support USB function)
R	UART/TTL interface, RXD, optional RS232-RXD
T	UART/TTL interface, TXD, optional RS232-TXD
G	V-BACK backup battery power, replace the long power supply pin of the backup battery
V	The main power supply of VCC system has a supply voltage of +3.3V~+5V

7. Typical application reference

Normal work

parameter	the smallest	standard	maximum	unit
voltage	3.3	5	5.5	V
temperature	-40	--	+85	℃
Working current	28	30	32	mA
storage temperature	-40	--	+85	℃

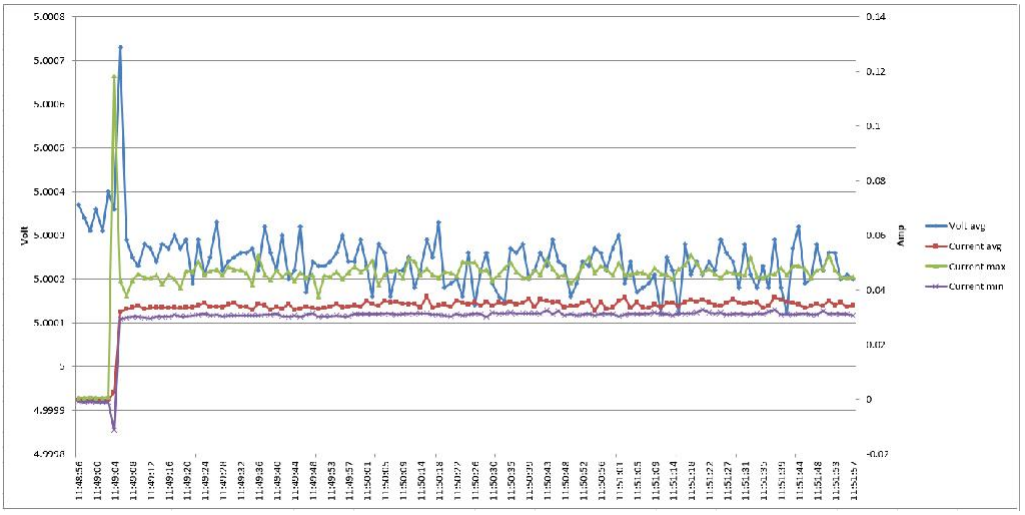
The RTC power supply has the conditions [RTC power supply is provided in the module, and the battery life is about 2Hour]

parameter	the smallest	standard	maximum	unit
RTC supply voltage	1.8	3.0	3.6	V
Current consumption	--	15	--	uA

Digital Interface Level Conditions

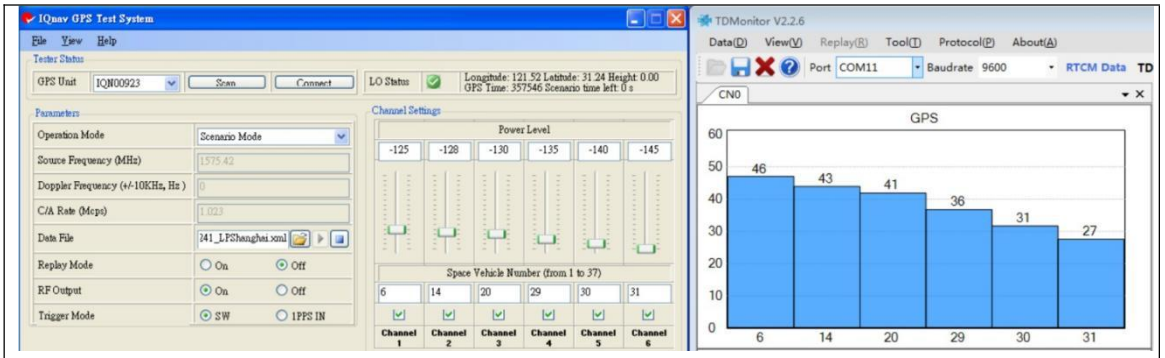
parameter	the smallest	standard	maximum	unit
input high level	1.8	3	3.3	V
input low level	--	--	0.8	V
input high level	2.4	2.8	3.3	V
input low level	--	--	0.4	V

Power-on instantaneous current curve



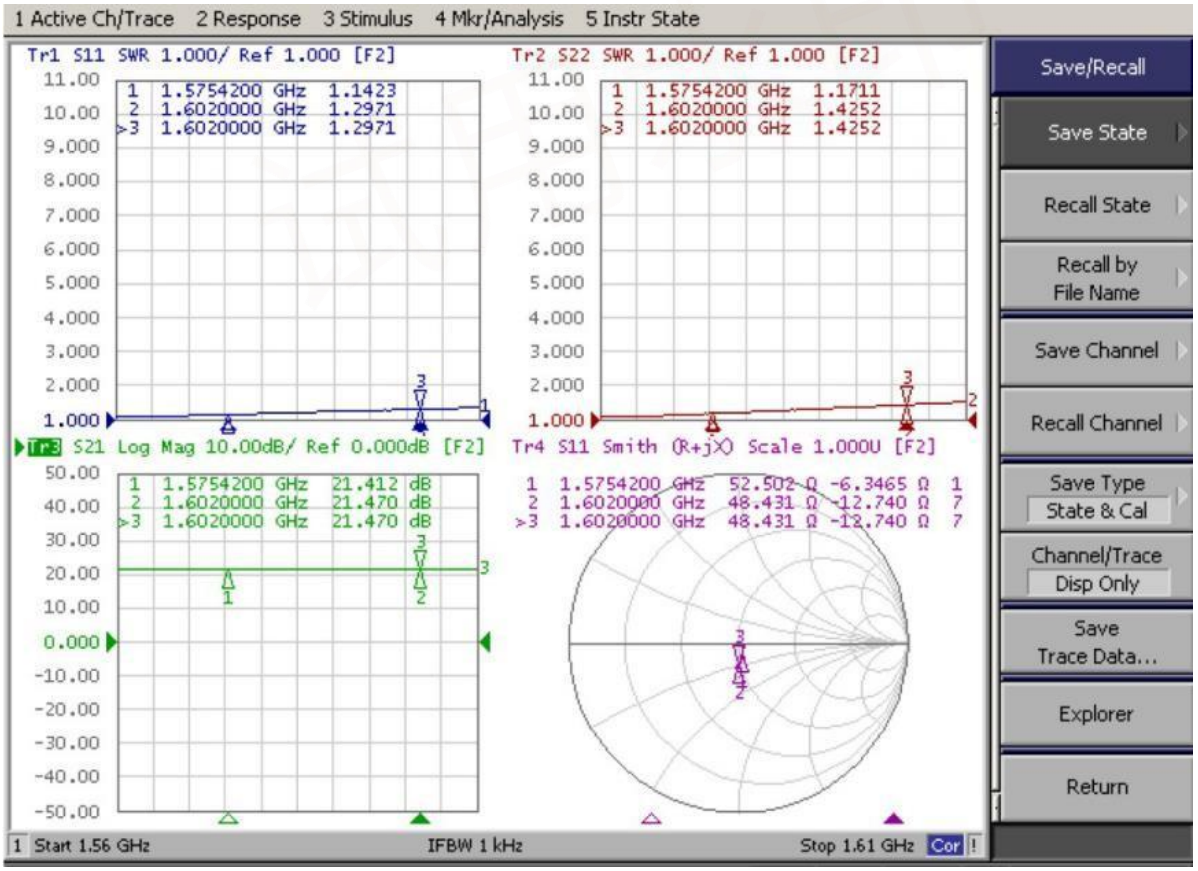
8. RF radio frequency diagram

8.1 Conduction test



Signal generator CNR	-125	-128	-132	-135	-140	-145
testing machine YXT-105M10	46	43	41	36	31	27

8.2 Module RF radio frequency diagram



9. NMEA0183 protocol description

NMEA0183 output

GGA: time, location, positioning typeGLL:
longitude, latitude, UTC time

GSA: GPS receiver operating mode, positioning used satellite, DOP value

GSV: visible GPS satellite information, elevation, azimuth, signal-to-noise ratio(SNR)

RMC: time, date, position, speed

VTG: Ground Speed Information

Sample data:

$GPGGA,051325.00,2240.60831,N,11359.87030,E,1,12,0.77,85.6,M,-2.7,M,,*69

$GPGSA,A,3,13,15,02,29,05,24,21,30,,,,,1.31,0.77,1.06*14

$GPGSA,A,3,83,69,84,79,85,70,,,,,,,1.31,0.77,1.06*14

$GPGSV,3,1,10,02,48,116,32,05,41,034,35,06,04,128,20,12,00,197,*75

$GPGSV,3,2,10,13,73,040,33,15,62,242,47,21,09,318,38,24,17,179,42*7E

$GPGSV,3,3,10,29,48,278,47,30,11,055,32*73

$GLGSV,3,1,11,68,03,043,,69,38,006,27,70,40,286,18,71,06,247,*6D

$GLGSV,3,2,11,78,01,050,,79,09,086,16,80,05,144,,83,30,160,28*68

$GLGSV,3,3,11,84,84,258,32,85,30,331,27,,,,37*65

$GPGLL,2240.60831,N,11359.87030,E,051325.00,A,A*7C

$GPRMC,051325.00,A,2240.60831,N,11359.87030,E,0.009,,231018,,,A*65

$GPVTG,,T,,M,0.009,N,0.018,K,A*3D

9.1 GGA

Sample data:$GPGGA,051325.00,2240.60831,N,11359.87030,E,1,12,0.77,85.6,M,-2.7,M,,*69

name	sample	unit	describe
informationID	$GPGGA		GGA protocol header
UTC time	051325.00		hhmmss.ss
latitude	2240.60831		ddmm.mmmmm
N/S	N		N=North, S=South
longitude	11359.87030		dddmm.mmmmm
E/W	E		W=West, E=East
positioning instructions	1		0:not located 1:SPS mode, positioning is valid 2:Differential, SPS mode, valid positioning 3:PPS mode, valid positioning
number of satellites	12		Range 0 to 12
HDOP	0.77		Horizontal accuracy
MSL amplitude	85.6	M	mean sea level
unit	M	M	Unit: m
the earth	-2.7	M	mean sea level
unit	M		Unit: m
differential		S	Invalid when there is no DGPS
differential ID			Invalid when there is no DGPS
checksum	*40		Checksum of ASCII codes of all characters between $ and *
<CR><LF>			end of message

9.2 RMC

sample data: $GPRMC,051325.00,A,2240.60831,N,11359.87030,E,0.009,,231018,,,A*65

name	sample	unit	describe
message ID	$GPRMC		RMC protocol header
UTC time	051325.00		hhmmss.ss
state	A		A=valid data; V=invalid data
latitude	2240.60831		ddmm.mmmmm
N/S	N		N=North, S=South
longitude	11359.87030		dddmm.mmmmm
E/W	E		W=West, E=East
speed	0.009	Knots	ground speed
azimuth		Spend	ground route
date	231018		date in day, month, year format
Magnetic variables			Magnetic field change value (blank - not supported)
Mode indication	A		A = autonomous localization, D = differential, E = estimate, N = invalid data
checksum	*65		Checksum of ASCII codes of all characters between $ and *
<CR><LF>			end of message

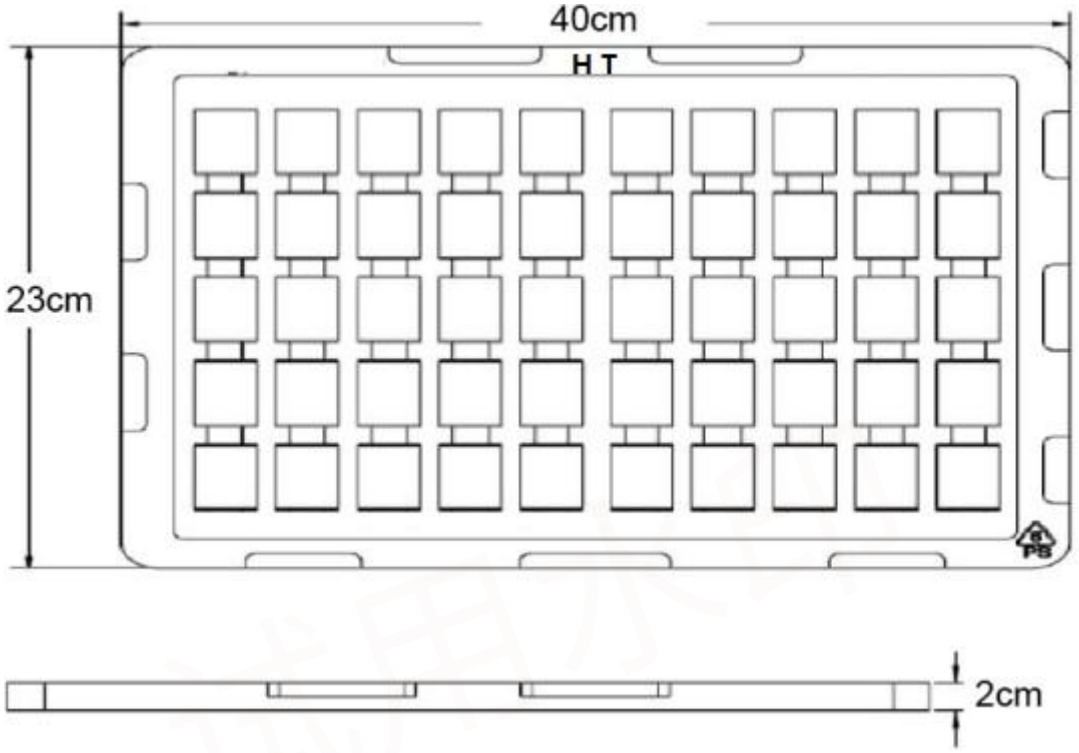
9.3 VTG

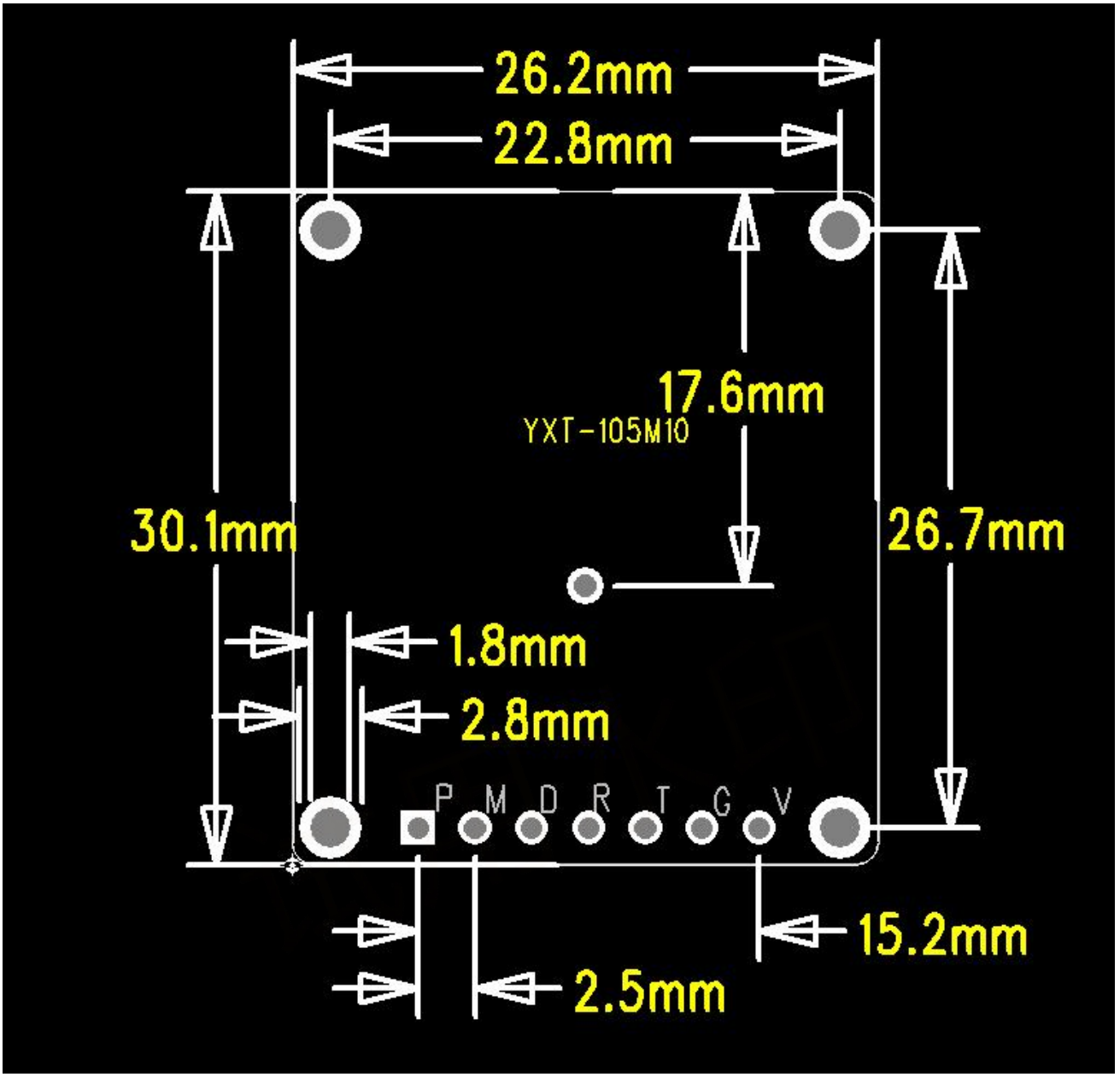
sample data: $GPVTG,,T,,M,0.009,N,0.018,K,A*3D

name	sample	unit	describe
message ID	$GPVTG		VTG protocol header
movement angle		Spend	000-359
refer to	T		true north frame of reference
movement angle		Spend	000-359
refer to	M		Magnetic North
speed	0.009	Knot	ground speed
unit	N		Festival
speed	0.018	km/h	If the number of leading digits is insufficient, fill in 0
unit	K		K=km/h, km/h
mode indication	A		A = autonomous localization, D = differential, E = estimate, N = invalid data
checksum	*3D		Checksum of ASCII codes of all characters between $ and *
<CR><LF>			end of message

10. Product packaging and appearance drawing

- Pallet size: 40cm (length) × 23cm (width) × 2cm (height)
- 1 layer tray 112PCS




26.2mm
22.8mm
17.6mm
YXT-105M10
30.1mm
26.7mm
1.8mm
2.8mm
P M D R T G V
15.2mm
2.5mm