SPECIFICATION OF APPROVAL

规 格 承 认 书

CUSTOMER /客户	
PRODUCT NAME/产品类别	GPS&GLONASS Module
PRODUCT NO./产品编号	34000015
MODEL No./产品型号	**U18GV2B-9600**
DATE/日期	2016-12-2
EDITION/版本	V:0A

SUPPLER/供应者签署	ACCEPTANCE/承认者签署

Date/日期	2016.12.2
R&D./研发部	
Engineer/工程师	
Prepared/制作	

Functional Overview

The U18GV2B-9600 designed by Dragon basing on the U-M8030-KT is a new generation take 3axis digital compass of GPS receiving module. It's up to 66 acquisition and 22 simultaneously tracking channel, ultra-high sensitive GPS receiving. module. Based on new highly integrated Ublox chips and meticulously integration key parts of Dragon.. In the same chip specifications, this product has faster GPS signals ability to capture, lower power consumption, more strong anti-jamming performance and more wide working voltage range.

U18GV2B-9600 module designed with industrial requirements, using stamps package, can adapt to wet high temperature, electromagnetic interference etc. odiously working environment. It is widely used in monitoring, positioning, mapping, navigation, security applications.

Applications

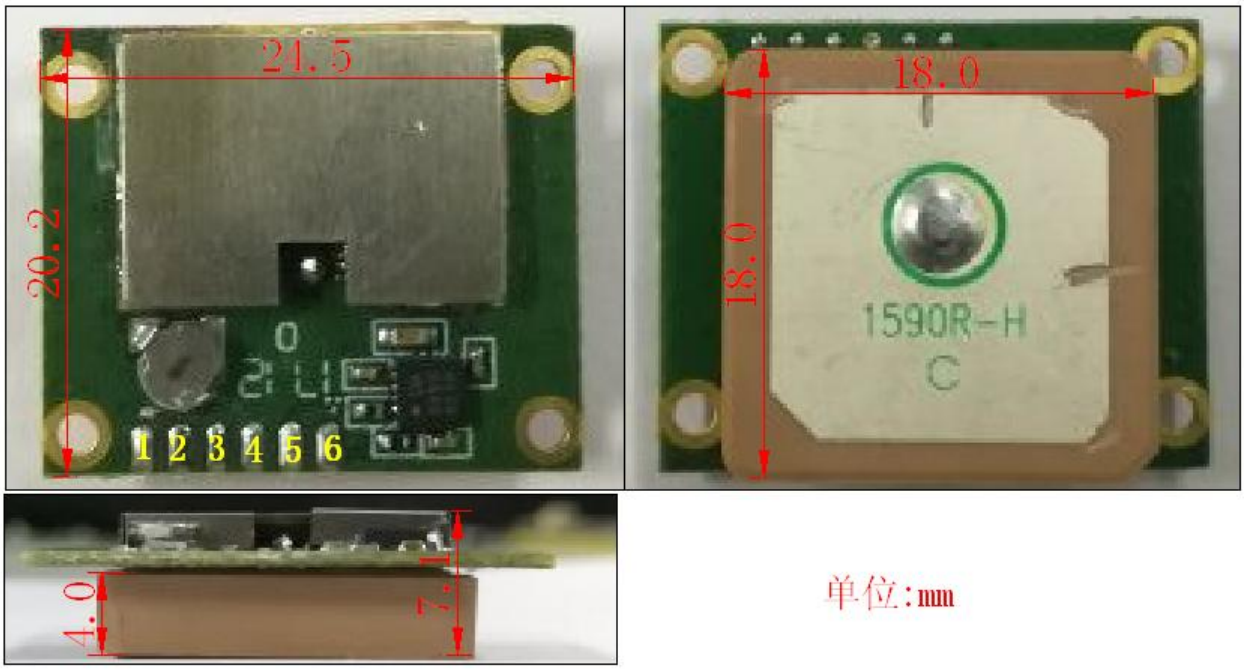
- Automotive navigation
- Personal positioning
- Fleet management
- Marine navigation

Product Features

- U-M8030-KT high performance GPS Chipset
- Very high sensitivity(Tracking Sensitivity:-167 d B m)
- Extremely fast TTFF(Time To First Fix) at low signal level
- Support UART interface
- Built-in LNA
- Compact size(24.5mmx20.2mmx7.1mm)suitable for space-sensitive application
- One size component, easy to mount on another PCB board
- Support NMEA0183 V3.0(GGA,GSA, GSV,RMC)
- Support OSP protocol
- MEMS Support: 3-axis Magnetometer for compass heading for "Point and Tell" feature
- Micro Power Mode (MPM) :Reduce MPM current consumption from<500uA
- Support GPS、GLONASS、GALILEO、SBAS(WASS、EGNOS、MSAS、GAGAN)
- Battery on board

- Antenna on board
- Three axis digital compass on board

Pin Assignment



Pin Description

Pin NO	Name	Type	Description	Remark
1	TX	O	UART Serial Data Output	NMEA Protocol
2	RX	I	UART Serial Data Input	NMEA Protocol
3	VCC	P	Module Power Supply	
4	GND	P	Ground	
5	SDA	I/O	DDC PINS	DDC Data. Leave open, if not used
6	SCL	I/O	DDC PINS	DDC Clock. Leave open if not used

Electrical Characteristics

Absolute maximum Rating

Parameter		Min	Max	Units
Power Supply				
Power Supply Volt	VCC	3.3	5.5	V
Input Pins				
Input Pin Voltage I/O	RXA	-0.3	3.63	V
Environment				
Storage Temperature	Tstg	-40	125	℃
Peak Reflow Soldering Temperature	Tneak		260	℃
Humidity			95	%

Note: Absolute maximum ratings are stress ratings only, and functional operation at the maxims is not guaranteed. Stress beyond the limits specified in this table may affect device reliability or cause permanent damage to the device. For functional operating conditions, refer to the operating conditions tables as follow.

Product Specifications

Parameter	Specification
Chip	U-M8030-KT
Receiver Type	L1 frequency band 1575.42 MHz, 72 - channel u - blox M8 engine GPS L1 C/A, GLONASS L10F QZSS L1 C/A, BeiDou B1 Galileo - ready E1B/C (need external flash memory) SBAS L1 C/A: WAAS and EGNOS, MSAS
Sensitivity	tracking & navigation: - 167 dBm heavy capture: -160 dBm Cold start: -148 dBm Warm start: -156 dBm
Accuracy	level positioning accuracy 2.0 m CEP Velocity 0.1m/s
Acquisition Time	Cold Start 26s (Typical Open Sky) Warm Start 22s Hot Start 1s
Power Consumption	Tracking 45mA @3.3V Typical Acquisition 40mA @3.3V
Navigation Data Update Rate	1Hz
Operational Limits	Altitude Max 50000m Velocity Max 500m/s Acceleration Less than 4g
Protocol Support	NMEA 0183 Ver.3.0 9600bps 1Hz: GGA,GSA,GSV,RMC,VTG,GLL

OPERATING Description

TX

This is the main transmits channel for outputting navigation and measurement data to user's navigation software or user written software. output is TTL level,0-3.3v

RX

This is the main channel for receiving
software commands from UBLOX demo software or from your proprietary software.

VCC

This is the main power supply to the engine board. (3.3V to 5.5V)

SOFTWARE COMMAND
NMEA Output Command

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.

The **U18GV2B-9600** supports the following NMEA-0183 messages: GGA, GSA, RMC. The module default NMEA-0183 output is set up GGA, GSA, GSV, RMC and default baud rate is set up 9600bps.

Table 1: NMEA-0183 Output Messages

NMEA Record	DESCRIPTION
GGA	Global positioning system fixed data
GSA	GNSS DOP and active satellites
GSV	GNSS satellites in view
RMC	Recommended minimum specific GNSS data

GGA-Global Positioning System Fixed Data

Table 2 contains the values of the following example:

$GPGGA, 025438.000, 2232.8557,N, 1 1 3 5 5 . 7 4 3 8 ,E, 1,04,1.0, 65.5,M, ,M, ,0000*75

Table 2: GGA Data Format

Name	Example	Units	Description
Message ID	$GPGGA		GGA protocol header
UTC Time	025438.000		hhmmss.sss
Latitude	2232.8557		ddmm.mmmm
N/S indicator	N		N=north or S=south
Longitude	1 1 3 5 5 . 7 4 3 8		ddmm.mmmm
E/W Indicator	E		E=east or W=west
Position Fix Indicator	1		See Table 2-1
Satellites Used	04		Range 00 to 12
HDOP	1.0		Horizontal Dilution of Precision
MSL Altitude	65.5	meters	Altitude above mean seal level
Units	M	meters	
Geoids Separation		meters	Separation from Geoids can be bank
Units	M	meters	
Age of Diff.Corr.		second	Null fields when DGPS is not Used
Diff.Ref.Station ID	0000		Null fields when DGPS is not Used
Checksum	*75		
<CR> <LF>			End of message termination(ASCII 13, ASCII 10)

Table 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

GSA-GNSS DOP and Active Satellites

Table 4 contains the values of the following example:
$GNGSA,A,3,78,80,70,79,68,69,,,,,,,1.20,0.93,0.75*18

Table 4: GSA Data Format

Name	Example	Units	Description
Message	$GNGSA		GSA protocol header
Mode 1	A		See Table 4-2
Mode 2	3		See Table 4-1
Satellite Used	78		Sv on Channel 1
Satellite Used	80		Sv on Channel 2
…	…		…
Satellite Used			Sv on Channel 12
PDOP	1.20		Position Dilution of Precision
HDOP	0.93		Horizontal Dilution of Precision
VDOP	0.75		Vertical Dilution of Precision
Checksum	*18		
<CR> <LF>			End of message termination(ASCII 13, ASCII 10)

Table 4-1: Mode 1

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

Table 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

Table 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.
Table 5: GSV 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(ASCII 13, ASCII 10)

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

Table 6 contains the values of the following example:

$GLGSV,3,1,09,84,61,112,40,74,36,001,27,85,34,175,39,83,30,041,42*69

$GLGSV,3,2,09,73,28,063,48,72,27,262,26,71,15,209,29,65,10,314,15*6A
$GLGSV,3,3,09,75,10,312,26*5B
Table 6: GLGSV Data Format

Name	Example	Units	Description
Message ID	$GLGSV		GSV protocol header
Number of Message	3		Range 1 to 3
Message Number	1		Range 1 to 3
Satellites in View	09		
Satellite ID	84		Channel 1(Range 1 to 32)
Elevation	61	degrees	Channel 1(Maximum 90)
Azinmuth	112	degrees	Channel 1(True, Range 0 to 359)
SNR(C/NO)	40	dBHz	Range 0 to 99,null when not tracking
…			…
Satellite ID	83		Channel 4(Range 1 to 32)
Elevation	30	degrees	Channel 4(Maximum 90)
Azimuth	041	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(ASCII 13, ASCII 10)

RMC-Recommended Minimum Specific GNSS Data

Table 7 contains the values of the following example:

GNRMC,095533.000,A,2242.4275,N,11350.2159,E,0.00,0.00,071213,,,A*74

Table 7: RMC Data Format

Name	Example	Units	Description
Message ID	$GNRMC		RMC protocol header
UTC Time	095533.000		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	,2242.4275		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	11350.2159		Ddmm.mmmm
E/W Indicator	E		E=east or W=west
Speed Over Ground	0.00	Knots	
Course Over Ground	071213	Degrees	True
Date	031209		Dummy
Magnetic variation		Degrees	Not used
E/W indicator			Not used
Mode			Only NMEA0183 version 3.00 output
Checksum	*74	hexadecimal	
<CR> <LF>			End of message termination(ASCII 13, ASCII 10)