PRODUCT SPECIFICATION

Module No. JS-M710

Customer

Issued Date

CUSTOMER SIGNATURE BAR

CUSTOMER	ADMISSION	APPROVAL

Shenzhen Jumpstar Technology Co.,Ltd

Tel : (86) 0755-23732282
Fax : (86) 0755-23732823
Add : 611Room,Tianhui Building A,Yousong Road, Longhua District, Shenzhen City, Guangdong Province, China

Signed by _____ **Approved by** _____

1. Product Information

Product Name:JS-M710

Product Description:

JS-M710 is a compact, high performance, and low power consumption GNSS engine board.

It uses the chipset which can track up to 66 channels at a time and perform fast TTFF in weak signal environments.

JS-M710 is suitable for the following applications:

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

Product Features:

- MediaTek high sensitivity solution
- Support 66-channel GPS
- Ultra low power consumption
- Fast TTFF at low signal level
- Built-in 12 multi-tone active interference canceller
- Free hybrid ephemeris prediction to achieve faster cold start
- Built-in data logger
- Built-in DC/DC converter to save power
- Up to 10 Hz update rate

- ±11ns high accuracy time pulse (1PPS)
- Capable of SBAS (WAAS, EGNOS, MSAS, GAGAN)
- Support Japan QZSS
- Indoor and outdoor multi-path detection and compensation
- Small form factor 10.1 * 9.7 * 2.5mm ±0.2mm
- SMD type with stamp holes
- RoHS compliant

Product Specifications

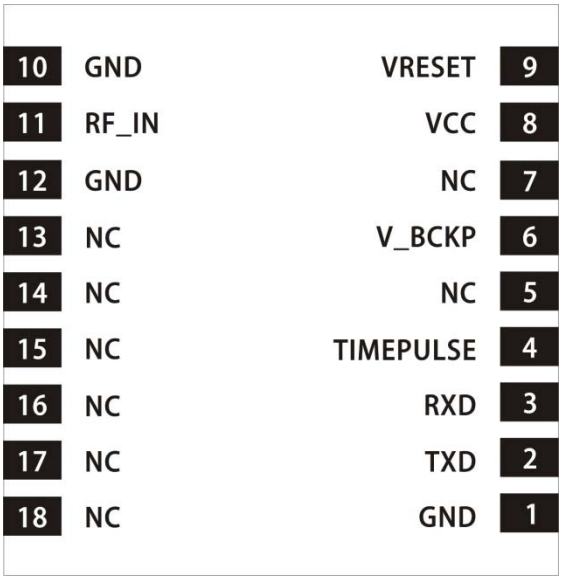
GPS Performance

GPS Receiver		
Chip	MediaTek MT3337 (Rom Version)	
Frequency	L1 1575.42MHz, C/A code	
Channels	Support 66 channels	
Update rate	1Hz default, up to 10Hz	
Sensitivity	Tracking	-162dBm, up to -165dBm (with external LNA)
	Cold Start	-143.5dBm, up to -148dBm (with external LNA)
Acquisition Time	Hot start (Open Sky)	< 1s (typical)
	Hot start (Indoor)	< 30s
	Cold Start (Open Sky)	32s (typical) without AGPS
		< 15s (typical) with AGPS (hybrid ephemeris prediction)
Position Accuracy	Autonomous	3m (2D RMS)
	SBAS	2.5m (depends on accuracy of correction data)
Max. Altitude	< 50,000 m	
Max. Velocity	< 515 m/s	
Protocol Support	NMEA 0183 ver 4.01	9600 bps, 8 data bits, no parity, 1 stop bits (default) 1Hz: GGA, GLL, GSA, GSV, RMC, VTG
Physical Characteristic		

Type	18 pin stamp holes
Dimensions	10.1mm * 9.7 mm * 2.5mm ±0.2mm

2. Technical Information

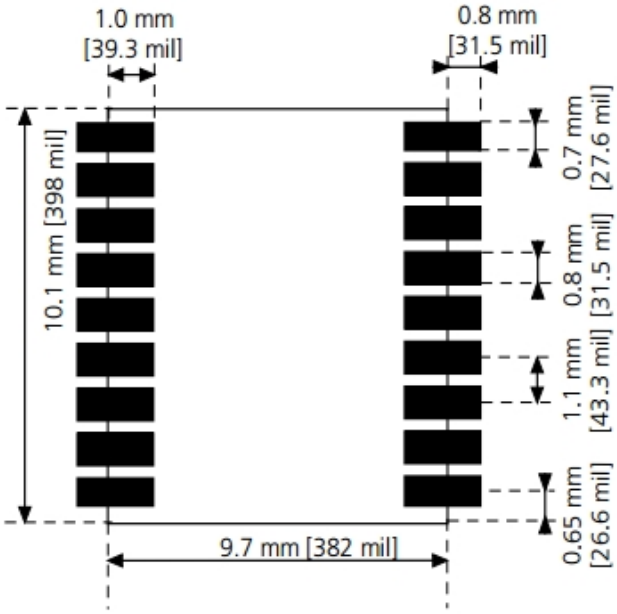
Module Pin Assignment



Pin NO.	Pin Name	I/O	Remark
1.	GND	G	Ground.
2.	TXD	O	Data Output
3.	RXD	I	Data Input
4.	TIMEPULSE	O	1 Pulse per second
5.	NC	N	Not connected
6.	V_BCKP	PWR	Backup battery supply voltage
7.	NC	N	Not connected
8.	VCC	PWR	Main power supply to the engine board.
9.	VRESET	I	Reset
10.	GND	G	Ground.
11.	RF_IN	RF	GPS antenna input
12.	GND	G	Ground.
13.	NC	N	Not connected
14.	NC	N	Not connected
15.	NC	N	Not connected
16.	NC	N	Not connected

17.	NC	N	Not connected
18.	NC	N	Not connected

Dimensions



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.

JS-M710 modules support the following NMEA-0183 messages: GGA, GLL,GSA, GSV, RMC and VTG.

Table 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

Table 2 contains the values of the following example:

$GPGGA,035148.000,2238.1641,N,11403.6682,E,2,12,0.83,115.1,M,-2.2,M,0000,0000*71

Table 2: GGA Data Format

Name	Example	Units	Description
Message ID	$GPGGA		GGA protocol header
UTC Position	035148.000		hhmmss.sss
Latitude	2238.1641		ddmm.mmmmm
N/S indicator	N		N=north or S=south
Longitude	11403.6682		ddmm.mmmmm
E/W Indicator	E		E=east orW=west
Position Fix Indicator	2		See Table 2-1
Satellites Used	12		Range 0 to 12
HDOP	0.83		Horizontal Dilution of Precision
MSLAltitude	115.1	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 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

Table 3 contains the values of the following example:

$GPGLL , 2238.1641, N,11403.6682,E,035148.000, A*2C.

Table 3: GLL Data Format

Name	Example	Units	Description
Message ID	$GPGLL		GLL protocol header
Latitude	2238.1641		Ddmm.mmmmm
N/S Indicator	N		N=north or S=south
Longitude	11403.6682		ddmm.mmmmm
E/W Indicator	W		E=east orW=west
UTC Position	035148.000		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

Table 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.

Table 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

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: 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

Table 6 contains the values of the following example:

$GPRMC,035148.000,A,2238.1641,N,11403.6682,E,0.02,358.09,290713,,,D*6F

Table 6: RMC Data Format

Name	Example	Units	Description
Message ID	$GPRMC		RMC protocol header
UTS Position	035148.000		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	2238.1641		ddmm.mmmmm
N/S Indicator	N		N=north or S=south
Longitude	11403.6682		Ddmm.mmmmm
E/W Indicator	E		E=east orW=west
Speed Over Ground	0.02	Knots	
Course Over	358.09	Degrees	True
Ground			
Date	290713		Dummy

Magnetic variation		Degrees	E=east or W=west
Checksum	*6F		
<CR> <LF>			End of message termination

VTG-Course Over Ground and Ground Speed

Table 7 contains the values of the following example:

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

Table 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