BN-180

GNSS Module + Antenna

Datasheet

Features =

Iitem	Description	
Electrical Characteristics	Chipset	M8030-KT
	Frequency	GPS L1, GLONASS L1, BDS B1, GALILEO E1, SBAS L1, QZSS L1
	Receiving Format	GPS, GLONASS, BDS, GALILEO, SBAS, QZSS. Default GPS, GLONASS, SBAS, QZSS.
	Channels	72 Searching Channel
Sensitivity	Tracking	-167dBm
	Reacquisition	-160dBm
	Cold Start	-148dBm
	Hot Start	-156dBm
Accuracy	Position Horizontal	2.0 m CEP 2D RMS SBAS Enable (Typical Open Sky)
	Velocity	0.1m/sec 95% (SA off)
	Timing	1us synchronized to GPS time
Acquisition Time	Cold Start	26s
	Warm Start	25s
	Hot Start	1s
Data Output	Support Rate	4800bps to 921600bps, Default 9600bps
	Data Level	TTL Level
	Data Protocol	NMEA-0183
	NMEA message	RMC, VTG, GGA, GSA, GSV, GLL
	Concurrent GNSS	1Hz-10Hz, Default 1Hz
Operational Limits	Altitude	<50,000m
	Velocity	<515m/s
	Acceleration	<4g
Power Consumption	VCC	DC Voltage 3.6V-5.5V, Typical: 5.0V
	Current	Capture 50mA/5.0V
Mechanical Specifications	Dimension	18mm*18mm*6mm
	Weight	4.9g
	Connector	1.00mm 4pins connector
Environment	Operating Temp	-40 °C ~ +85°C
	Storage Temp	-40°C ~ +105°C
LED	Built-in LED	TX LED: blue. The data output, TX LED flashing
		PPS LED: red. PPS LED not bright when GPS not fixed, flashing when fixed

Pin Description：

PIN	PIN Name	I/O	Description
1	GND	G	Ground
2	TX	O	Serial Data Output.
3	RX	I	Serial Data Input.
4	VCC	I	DC 3.6V - 5.5V supply input,Typical: 5.0V

LED：

1. TX LED:blue.The data output, TX LED flashing
2. PPS LED:red.PPS LED not bright when GPS not fixed， flashing when fixed.

Rear view：

NMEA message output sample =

$GNRMC,073114.00,A,2237.56240,N,11401.59614,E,1.329,21.11,020916,,,A,V*37
$GNVTG,21.11,T,,M,1.329,N,2.462,K,A*1B
$GNGGA,073114.00,2237.56240,N,11401.59614,E,1,12,0.78,112.9,M,-2.5,M,,*54
$GNGSA,A,3,19,05,02,06,17,12,09,13,,,,,1.48,0.78,1.26,1*01
$GNGSA,A,3,69,83,84,70,68,82,,,,,,,1.48,0.78,1.26,2*0E
$GPGSV,4,1,13,02,46,340,36,05,52,254,37,06,42,041,41,09,22,053,40,0*6E
$GPGSV,4,2,13,12,32,282,35,13,13,185,33,17,36,131,37,19,57,119,44,0*66
$GPGSV,4,3,13,20,03,237,,23,00,038,,25,09,311,19,42,51,128,32,0*60
$GPGSV,4,4,13,50,46,123,33,0*50
$GLGSV,2,1,08,68,25,027,39,69,78,011,36,70,40,213,43,74,00,259,,0*78
$GLGSV,2,2,08,82,06,124,36,83,46,085,44,84,44,358,41,85,05,324,14,0*74
$GNGLL,2237.56240,N,11401.59614,E,073114.00,A,A*7C

NMEA Message Talker IDs:

Configured GNS	Talker ID
GPS, SBAS, QZSS	GP
GLONASS	GL
GALILEO	GA
BEIDOU	GB
Any combination of GNSS	GN

NMEA Message Structure:

$xxGGA,time,lat,NS,long,EW,quality,numSV,HDOP,alt,M,sep,M,diffAge,diffStation*cs<CR><LF>

Example:

$GPGGA,092725.00,4717.11399,N,00833.91590,E,1,08,1.01,499.6,M,48.0,M,,*5B

Field No	Name	Unit	Format	Example	Description
0	xxGGA	-	string	$GPGGA	GGA Message ID (xx = current Talker ID)
1	time	-	hhmmss.ss	092725.00	UTC time
2	lat	-	ddmm.mmmmm	4717.11399	Latitude (degrees & minutes)
3	NS	-	character	N	North/South indicator
4	long	-	dddmm.mmmmm	00833.91590	Longitude (degrees & minutes)
5	EW	-	character	E	East/West indicator
6	quality	-	digit	1	0:No Fix / Invalid 1:Standard GPS (2D/3D) 2:Differential GPS 6:Estimated (DR) Fix
7	numSV	-	numeric	08	Number of satellites used
8	HDOP	-	numeric	1.01	Horizontal Dilution of Precision
9	alt	m	numeric	499.6	Altitude above mean sea level
10	uAlt	-	character	M	Altitude units: meters (fixed field)
11	sep	m	numeric	48.0	Geoid separation: difference between

					geoid and mean sea level
12	uSep	-	character	M	Separation units: meters (fixed field)
13	diffAge	s	numeric	-	Age of differential corrections (blank when DGPS is not used)
14	diffStation	-	numeric	-	ID of station providing differential corrections (blank when DGPS is not used)
15	cs	-	hexadecimal	*5B	Checksum
16	<CR><LF>	-	character	-	Carriage return and line feed

Message Structure:

$xxGLL,lat,NS,long,EW,time,status,posMode*cs<CR><LF>

Example:

$GPGLL,4717.11364,N,00833.91565,E,092321.00,A,A*6

Field No	Name	Unit	Format	Example	Description
0	xxGLL	-	string	$GPGLL	GLL Message ID (xx = current Talker ID)
1	lat	-	ddmm.mmmmm	4717.11364	Latitude (degrees & minutes)
2	NS	-	character	N	North/South indicator
3	long	-	dddmm.mmmmm	00833.91565	Longitude (degrees & minutes)
4	EW	-	character	E	East/West indicator
5	time	-	hhmmss.ss	092321.00	UTC time
6	status	-	character	A	V = Data invalid or receiver warning, A = Data valid
7	posMode	-	character	A	Positioning mode
8	cs	-	hexadecimal	*60	Checksum
9	<CR><LF>	-	character	-	Carriage return and line feed

Message Structure:

$xxGSA,opMode,navMode{,sv},PDOP,HDOP,VDOP,systemId*cs<CR><LF>

Example:

$GPGSA,A,3,23,29,07,08,09,18,26,28,,,,,1.94,1.18,1.54,1*0D

Field No	Name	Unit	Format	Example	Description
0	xxGSA	-	string	$GPGSA	GSA Message ID (xx = current Talker ID)
1	opMode	-	character	A	Operation mode M:Manually set to operate in 2D or 3D mode A:Automatically switching between 2D or 3D mode
2	navMode	-	digit	3	Navigation mode 1:Fix not available 2:2D Fix 3:3D Fix
Start of repeated block (12 times)					
3 + 1*N	sv	-	numeric	29	Satellite number

End of repeated block					
15	PDOP	-	numeric	1.94	Position dilution of precision
16	HDOP	-	numeric	1.18	Horizontal dilution of precision
17	VDOP	-	numeric	1.54	Vertical dilution of precision
18	systemId	-	numeric	1	NMEA defined GNSS System ID NMEA v4.1 and above only
19	cs	-	hexadecimal	*0D	Checksum
20	<CR><LF>	-	character	-	Carriage return and line feed

Message Structure:

$xxGSV,numMsg,msgNum,numSV,{,sv,elv,az,cno},signalId*cs<CR><LF>

Example:

$GPGSV,3,1,10,23,38,230,44,29,71,156,47,07,29,116,41,08,09,081,36,0*7F

$GPGSV,3,2,10,10,07,189,,05,05,220,,09,34,274,42,18,25,309,44,0*72

$GPGSV,3,3,10,26,82,187,47,28,43,056,46,0*7

Field No	Name	Unit	Format	Example	Description
0	xxGSV	-	string	$GPGSV	GSV Message ID (xx = GSV Talker ID)
1	numMsg	-	digit	3	Number of messages, total number of GSV messages being output
2	msgNum	-	digit	1	Number of this message
3	numSV	-	numeric	10	Number of satellites in view
Start of repeated block (1..4 times)					
4 + 4*N	SV	-	numeric	23	Satellite ID
5 + 4*N	elv	deg	numeric	38	Elevation (range 0-90)
6 + 4*N	az	deg	numeric	230	Azimuth, (range 0-359)
7 + 4*N	cno	dBH	numeric	44	Signal strength (C/N0, range 0-99), blank when not tracking
End of repeated block					
5.. 16	signalId	-	numeric	0	NMEA defined GNSS Signal ID (0 = All signals) NMEA v4.1 and above only
6.. 16	cs	-	hexadecimal	*7F	Checksum
7.. 16	<CR><LF>	-	character	-	Carriage return and line feed

Message Structure:

$xxRMC,time,status,lat,NS,long,EW,spd,cog,date,mv,mvEW,posMode,navStatus*cs<CR><LF>

Example:

$GPRMC,083559.00,A,4717.11437,N,00833.91522,E,0.004,77.52,091202,,,A,V*57

Field No	Name	Unit	Format	Example	Description
0	xxRMC	-	string	$GPRMC	RMC Message ID (xx = current Talker ID)

1	time	-	hhmmss.ss	083559.00	UTC time, see note on UTC representation
2	status	-	character	A	Status V:Navigation receiver warning A :Data valid, see position fix flags description
3	lat	-	ddmm.mmmmm	4717.11437	Latitude (degrees & minutes), see format description
4	NS	-	character	N	North/South indicator
5	long	-	dddmm.mmmmm	00833.91522	Longitude (degrees & minutes), see format description
6	EW	-	character	E	East/West indicator
7	spd	Knos	numeric	0.004	Speed over ground
8	cog	degr	numeric	77.52	Course over ground
9	date	-	ddmmyy	091202	Date in day, month, year format, see note on UTC representation
10	mv	degrees	numeric	-	Magnetic variation value (blank - not supported)
11	mvEW	-	character	-	Magnetic variation E/W indicator (blank - not supported)
12	posMode	-	character	-	Mode Indicator, see position fix flags
13	navStatus	-	character	V	Navigational status indicator (V = Equipment is not providing navigational status information)
14	cs	-	hexadecimal	*57	Checksum
15	<CR><LF>	-	character	-	Carriage return and line feed

Message Structure:

$xxVTG,cogt,T,cogm,M,knots,N,kph,K,posMode*cs<CR><LF>

Example:

$GPVTG,77.52,T,,M,0.004,N,0.008,K,A*06

Field No	Name	Unit	Format	Example	Description
0	xxVTG	-	string	$GPVTG	VTG Message ID (xx = current Talker ID)
1	cogt	degrees	numeric	77.52	Course over ground (true)
2	T	-	character	T	Fixed field: true
3	cogm	degrees	numeric	-	Course over ground (magnetic), not output
4	M	-	character	M	Fixed field: magnetic
5	knots	knots	numeric	0.004	Speed over ground
6	N	-	character	N	Fixed field: knots
7	kph	km/	numeric	0.008	Speed over ground
8	K	-	character	K	Fixed field: kilometers per hour
9	posMode	-	character	A	Mode Indicator, see position fix flags description
10	cs	-	hexadecimal	*06	Checksum

11	<CR><LF>	-	character	-	Carriage return and line feed

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