# M20 GNSS High-precision Module

Full Constellation & Frequency Anti-jamming L-Band

Introduction

M20 is a high-precision RTK positioning module, it has 54 pins with package of LGA. The high-precision measurement engine, navigation engine and functional safety processor are integrated in the module. It supports the anti-jamming of 65 dBc narrowband, full-constellation and full-frequency RTK solution to deal with harsh environments such as satellite signal interference and multipath. It can provide continuous, real-time and reliable high-precision position and can be applied to automated driving, drones, precision agriculture, surveying, mapping, etc.

17mm

22mm

CE FC IC UK CA RoHS compliant REACH COMPLIANT
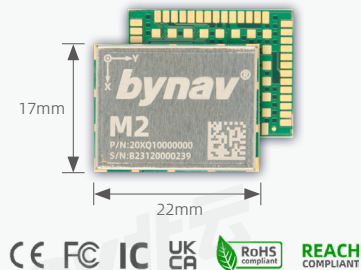
Technological Advantage

Full Constellation&Frequency GNSS Signal Solution

It supports BDS/GPS/GLONASS/Galileo/QZSS Full Constellation & Frequency high-precision RTK solution. And the built-in Bynav REAL (Ransac Enhanced Advanced Location) GNSS positioning engine has integrity monitoring to improve the fault tolerance and fixed solution rate under multipath and interference conditions in urban area, it can provide more stable and accurate results.

High-performance Multiple Interference Suppression

SAIF（Smart Advanced Interference Defense), the high-performance multiple interference suppression technoloy with high AD quantization bits, is built in and capable of handling different interferences such as single-frequency, multitone, sweeping, pulse, narrowband with interference-signal ratio of 65 dBc. It can deal with vehicle anti-tracking equipment, radar/airport signal towers etc. and greatly improve the availability and integrity of high-precision positioning in vehicle scenarios.

L-Band*, CLAS*, B2b (PPP)* and E6 (HAS)*

It supports L-Band* SBAS signal reception, can provide high-precision positioning in environments where conventional differential services or mobile communication services are unavailable. It supports BeiDou-3 B2b PPP* and E6 HAS* solutions, fully utilizing the four-frequency signals from BeiDou and Galileo to significantly improve PPP convergence speed and enhance the availability of high-precision positioning.

Functional Safety ASIL B

The design is based on ISO26262 ASIL B functional safety requirements. With built-in functional safety GNSS SoC Alice and algorithm, high-precision position, velocity and time with system-level functional safety can be provided for intelligent vehicles and autonomous driving.

Feature

» Independent Intellectual Property Rights

» Full Constellations and Full Frequency (1507 Channels)

» High-performance Anti-jamming*

» Support Ethernet Port, Embedded SDK Differential Account, Support gPTP Time Synchronization

» AP Partition Design Ensures Stable and Reliable OTA Upgrades

» Support System Self-check and Fault Diagnosis*

Application

Intelligent Driving

Agriculture

Drone

Surveying

Digital Construction

Geological Monitoring

Performance

Constellation: GPS, BDS, GLO, GAL, QZSS, NavIC

Number of Channel: 1507

Tracking

L-Band*	3 channels, 1525~1559 MHz
BDS-2	B1I, B2I, B3I
BDS-3	B1I, B1C*, B2a, B2b*(PPP)
GPS	L1 C/A, L1C*, L2, L5
GLO	G1, G2
GAL	E1, E5a, E5b, E6*
QZSS	L1 C/A, L1C, L2, L5, L6*
NavIC	L5
SBAS*	L1 C/A

Anti-jamming*

Single-frequency, Multitone, Sweeping, Pulse, Narrowband;

Interference-Signal Ratio: 65 dBc

Interface

UART	×4
SPI*	×1
CAN FD	×2
ANT_DETECT	×1
PPS	×1
EVENT_IO	×5
RMII	×1

Horizontal Positioning Accuracy (RMS)[1,2]

Single Point	1.5 m
RTK	1.0 cm + 1 ppm

Vertical Positioning Accuracy (RMS)[1,2]

Single Point	2.5 m
RTK	1.5 cm + 1 ppm

Max. Output Rate

GNSS Observation	10 Hz
GNSS Positioning Result [9]	10 Hz

Time To First Fix

Cold Start [3,5]	≤ 30 s
Hot Start [4,5]	≤ 5 s
RTK Initialization[1]	≤ 5 s
Re-acquisition Time	≤ 1 s
Timing Accuracy (RMS) [7]	≤ 20 ns
Velocity Accuracy [6]	0.03 m/s
RTK Solution Delay	≤ 50 ms

Accuracy (RMS)	BDS	GPS	GLO	GAL
B1I、B1C、L1C、L1 C/A、E1、G1 Pseudorange	10cm	10cm	10cm	10cm
B1I、B1C、L1C、L1 C/A、E1、G1 Carrier Phase	1mm	1mm	1mm	1mm
B2I、B2a、B2b、L5、E5a、E5b Pseudorange	10cm	10cm	10cm	10cm
B2I、B2a、B2b、L5、E5a、E5b Carrier Phase	1mm	1mm	1mm	1mm
B3I、L2、G2 Pseudorange	10cm	10cm	10cm	10cm
B3I、L2、G2 Carrier Phase	1mm	1mm	1mm	1mm

Mechanical and Electrical

Size	17.0 × 22.0 × 2.75 mm
Package	54 PIN LGA
Weight	2 g
Power Consumption [8]	495 mW
Power Supply Range	3.0~3.6 V

Environment and Certification

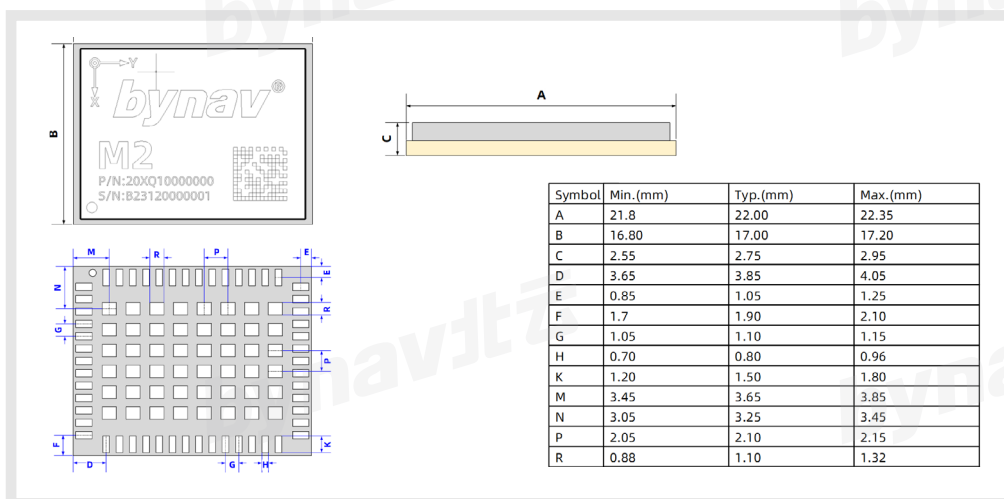|	
Operation Temperature [10]	-40 ℃ ~ +85 ℃
Storage Temperature [11]	-55 ℃ ~ +150 ℃
Humidity	95% Non-condensing
Vibration	JESD22-B103
Shock	JESD22-B110
IATF 16949*	
ISO 26262 ASIL B*	
AEC-Q104*	

Note:

1. Typical value. Performance will be affected by GNSS status, satellites' location, baseline length, multipath and other interference;
2. Using 1 km baseline and the receiver with good antenna performance, without considering possible errors due to antenna phase center offset;
3. Typical value. There is no almanac, ephemeris and approximate position or time;
4. Typical value. Almanac, ephemeris and approximate position or time are preserved;
5. -130dBm and more than 12 satellites are available;
6. Open sky without any obstruction, 99%@ static;
7. Optional. Bias caused by RF and antenna is not included;
8. Typical value. Power of antenna and peripherals is not included;
9. 20Hz is supported in special firmware;
10. There is optional temperature range of -40℃~105℃ ;
11. There is optional temperature range of -40℃~150℃ ;
* Optional, supported in special firmware.

Mechanical Specification

Symbol	Min.(mm)	Typ.(mm)	Max.(mm)
A	21.8	22.00	22.35
B	16.80	17.00	17.20
C	2.55	2.75	2.95
D	3.65	3.85	4.05
E	0.85	1.05	1.25
F	1.7	1.90	2.10
G	1.05	1.10	1.15
H	0.70	0.80	0.96
K	1.20	1.50	1.80
M	3.45	3.65	3.85
N	3.05	3.25	3.45
P	2.05	2.10	2.15
R	0.88	1.10	1.32

More information, please refer to

www.bynav.com

Wechat Official Account

Please contact us for more information of products!

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