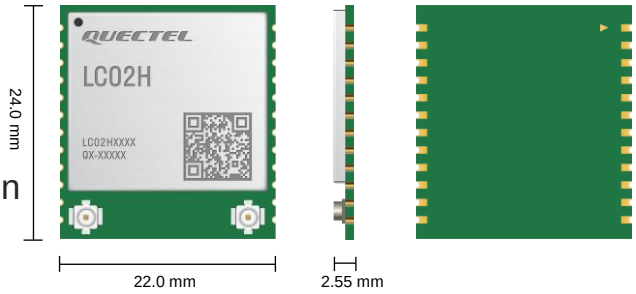
Quectel LC02H (BA)

Dual Antenna Multi-constellation High-precision Positioning & Orientation GNSS Module



The LC02H (BA) is a high-performance, low-power positioning and orientation GNSS module, which provides concurrent multi-constellation support including GPS, GLONASS, Galileo, BDS and QZSS.

The LC02H (BA) contains two independent satellite navigation receiver chips and uses a built-in custom dual-antenna orientation algorithm with short initialization time and high reliability. Whether stationary or moving, it can output high-precision heading, pitch, and other measurement information in real time. Furthermore, by utilising the optional internal IMU, the LC02H (BA) can measure the roll angle of the device to which it is securely mounted and precisely determine the device's complete three-dimensional attitude (heading angle, pitch angle and roll angle) by processing the collected satellite measurements.

The built-in LNAs and SAW filters enhance the sensitivity and anti-jamming capabilities of the LC02H (BA) and ensure superior performance in diverse and challenging environments. The module integrates advanced low-power management to ensure efficient GNSS positioning for battery and power sensitive designs.

Being able to compute high-precision device attitude and orientation at low power levels makes the LC02H (BA) well-suited for applications such as antenna positioners, construction machinery posture control systems, geological monitoring devices, precision agriculture as well as vehicle and ship positioning & orientation systems.

Key Features

- Multi-satellite systems parallel: BDS, GPS, GLONASS, Galileo and QZSS
- Dual antenna high precision orientation
- Support GNSS + MEMS combined attitude measurement
- Integrated LNA for high sensitivity
- Integrated SAW filter for noise cancellation
- IPEX connectors allowing for connection to external antennas

Dual Antenna Multi-constellation System

High-precision Orientation Measurement

Tracking Sensitivity: 165 dBm

Anti-jamming

Low Power Consumption

Operating Temperature Range: -40 to +85 °C

RoHS Compliant

Version: 1.0 | Status: Released

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GNSS Module	LC02H (BA)
Dimensions	22.0 mm × 24.0 mm × 2.55 mm
Weight	Approx 2.5 g
Temperature Range	
Operating Temperature	-40 °C ~ +85 °C
Storage Temperature	-40 °C ~ +90 °C
GNSS Features	
Supported Bands	GPS: L1 C/A GLONASS: L1 Galileo: E1 BDS: B1I QZSS: L1 C/A
Default Constellations	GPS + GLONASS + Galileo + BDS + QZSS
Number of Concurrent GNSS	4 + QZSS
SBAS*	WAAS, EGNOS, MSAS and GAGAN
Orientation Accuracy ①	Heading ②: 0.2° Pitch: 0.3° Roll: 0.3°
Initialization Time	< 60 s
Position Accuracy ③	Horizontal: 1.5 m CEP Vertical: 3.5 m CEP
Accuracy of 1PPS Signal (RMS) ④	30 ns
TTFF (with AGNSS) ⑤	Cold Start: 5 s Warm Start: 2 s Hot Start: 1 s
TTFF (without AGNSS) ④	Cold Start: 28 s Warm Start: 22 s Hot Start: 1 s
Sensitivity (@ Default Constellations) ⑥	Acquisition: -148 dBm Tracking: -165 dBm Reacquisition: -160 dBm
Dynamic Performance ④	Maximum Altitude: 10000 m Maximum Velocity: 500 m/s Maximum Acceleration: 4g
Update Rate	1 Hz
Certifications	
Regulatory	CE*
Others	RoHS
Interfaces	
SPI*	× 1
I2C*	× 1 (Multiplexed from SPI)
UART	× 3 UART1/UART2: Adjustable: 9600–921600 bps; Default: 115200 bps UART3*: Adjustable: 115200~3000000 bps
Protocol	NMEA 0183
External Antenna Interface	
Antenna Type	Active or Passive
Antenna Power Supply	Internal
Electrical Characteristics	
Supply Voltage Range	3.1–3.6 V, Typ. 3.3 V
I/O Voltage	Typ. 2.8 V
Current Consumption (@ 3.3 V) ④	**Normal Operation:** 83 mA (273.9 mW) @ Acquisition 83 mA (273.9 mW) @Tracking **Power Saving Mode:** 50 µA (165 µW) @ Backup Mode

NOTE:
1. ①: Refers to the standard deviation value.
2. ②: Static, open-sky, 1 m baseline length.
3. ③: CEP, 50 %, 24 hours static, -130 dBm, more than 6 SVs.
4. ④: Default constellations, room temperature, all satellites at -130 dBm.
5. ⑤: Open-sky, active high precision GNSS antenna.
6. ⑥: Tested with an external LNA with 17.0 dB gain and 0.55 dB noise figure, room temperature, with simulator.
7. * : Under development/in progress.

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