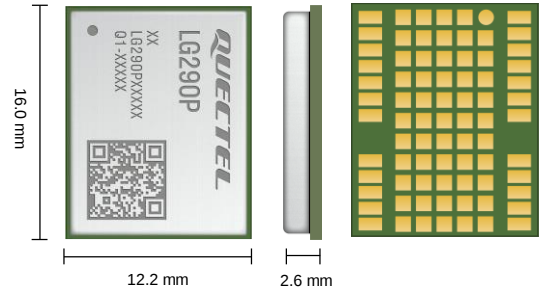


Quectel LG290P (03)

Multi-Constellation and Quad-Band

High-Precision GNSS Module



Quectel LG290P (03) is a quad-band, multi-constellation high-precision GNSS module, which supports simultaneous reception of GPS, GLONASS, Galileo, BDS, QZSS and NavIC constellations, as well as SBAS augmentation systems (WAAS, EGNOS, BDSBAS, MSAS, GAGAN and SDCM). It also supports Precise Point Positioning services like PPP-B2b and PPP-HAS.

LG290P (03)'s built-in professional-grade interference detection and cancellation algorithm effectively mitigates multiple narrow-band interferences. This significantly enhances signal reception performance, particularly in complex electromagnetic environments. Furthermore, LG290P (03) supports multi-constellation, quad-band RTK algorithms, ensuring fast and reliable high-precision positioning even in challenging environments like urban canyons and under dense foliage. It also features an RTKHOLD function, which leverages observation data model prediction technology to maintain high-precision positioning for up to 10 minutes in the event of unexpected RTK differential service interruptions.

LG290P (03) supports integrity information detection functions, such as protection levels, which can assist in control decision-making for applications like automated navigation. It also supports on-chip memory ECC (Error Correction Code) verification and a Secure Boot mode, providing additional protection for firmware security. Additionally, the module offers rich peripheral interfaces, including UART and I2C*, to meet diverse user application requirements.

With its advantages of high precision and low power consumption, the LG290P (03) is an ideal choice for high-precision navigation applications such as intelligent robots, precision agriculture, mining, surveying and mapping, and autonomous driving.



Key Features

- ✓ Multi-GNSS constellation for GPS, GLONASS, Galileo, BDS, QZSS and NavIC
- ✓ SBAS system (WAAS, EGNOS, BDSBAS, MSAS, GAGAN and SDCM)
- ✓ Reception of L1, L2, L5 and E6 GNSS quad-band signals concurrently
- ✓ High update rate up to 20 Hz even in RTK mode
- ✓ Quad-band RTK with fast convergence time and high accuracy
- ✓ Excellent urban canyon performance
- ✓ Built-in professional-grade NIC anti-jamming unit to suppress multiple narrow-band interference sources
- ✓ Abundant interfaces: UART and I2C*
- ✓ PPP-HAS E6/PPP-B2b/RTKHOLD/AGNSS* technology



Multi-constellation



Quad-band



High update rate



Tracking Sensitivity:
-160 dBm



Operating Temperature
Range: -40 °C to +85 °C



Anti-jamming



RoHS Compliant



Ultracompact Size



AGNSS Technology

Quectel LG290P (03)

GNSS Module	LG290P (03)
Dimensions	12.2 mm × 16.0 mm × 2.6 mm
Weight	Approx. 0.9 g
Temperature Range	
Operating Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +90 °C
GNSS Features	
	GPS: L1 C/A, L1C*, L5, L2C GLONASS: L1, L2 Galileo: E1, E5a, E5b, E6 BDS: B1I, B1C, B2a, B2b, B2I, B3I QZSS: L1 C/A, L1C*, L5, L2C, L6 NavIC: L5 SBAS: L1
Supported Bands	
Default Constellations	GPS + GLONASS + Galileo + BDS + QZSS + NavIC
Number of Tracking Channels	1040
Number of Concurrent GNSS	5 + QZSS
SBAS	WAAS, EGNOS, BDSBAS, MSAS, GAGAN and SDCM
Horizontal Position Accuracy	Autonomous ^① : 0.7 m RTK ^② : 0.8 cm + 1 ppm
Vertical Accuracy	Autonomous ^① : 2.5 m RTK ^② : 1.5 cm + 1 ppm
Velocity Accuracy ^③	Without Aid: 0.03 m/s
Accuracy of 1PPS Signal ^③ (1σ)	5 ns
RTK Convergence Time ^②	5 s
TTFF ^③ (without AGNSS)	Cold Start: 28 s Warm Start: 28 s Hot Start: 1.7 s
Sensitivity ^④ (@ Default Constellations)	Acquisition: -146 dBm Tracking: -160 dBm Reacquisition: -155 dBm
Dynamic Performance ^③	Maximum Altitude: 18000 m Maximum Velocity: 515 m/s Maximum Acceleration: 4g
Update Rate	Default: 10 Hz Max. 20 Hz
Certifications	
Regulatory	Europe: CE
Others	RoHS
Interfaces	
I2C*	× 1 Max. 400 kbps
UART	× 3 (UART1, UART2 and UART3) Adjustable: 9600–921600 bps Default: 460800 bps
Protocols	
Protocols	NMEA 0183/RTCM 3.x
Antenna Interface	
Antenna Type	External active antenna ^⑤
Antenna Power Supply	External or Internal (via VDD_RF)
Electrical Characteristics	
Supply Voltage Range (VCC)	3.0–3.6 V, Typ. 3.3 V
I/O Voltage	Following VCC
Power Consumption ^③ (@ 3.3 V, Default Constellations)	Normal Operation: 99 mA (326.7 mW) @ Acquisition 99 mA (326.7 mW) @ Tracking Power Saving Mode: 18 μA (59.4 mW) @ Backup Mode

NOTE:

*: Under development.

1. ①: Measured under CEP 50% positioning accuracy, static conditions over 24 hours, signal strength of -130 dBm, with instrument configured for GPS L1 + L5, Galileo E1 + E5a, and BDS B1I + B2a signals.

2. ②: Measured under CEP 50% positioning accuracy in open-sky conditions using high-precision active GNSS antennas, with baseline lengths maintained below 1 km.

3. ③: Tested at 25 °C ambient temperature under typical operating voltage, with satellite signals set to -130 dBm using test instruments.

4. ④: Tested using two external LNAs (18.5 dB gain, 0.85 dB noise figure), with minimum tracked satellites: GPS L1 + L5 ≥ 12, BDS B1I + B2a ≥ 10, Galileo E1 + E5a ≥ 10.

5. ⑤: To mitigate the impact of out-of-band interference on GNSS module performance, active antennas with the SAW filter placed in front of the LNA must be used. DO NOT use active antennas where the LNA is placed in front of the SAW filter.