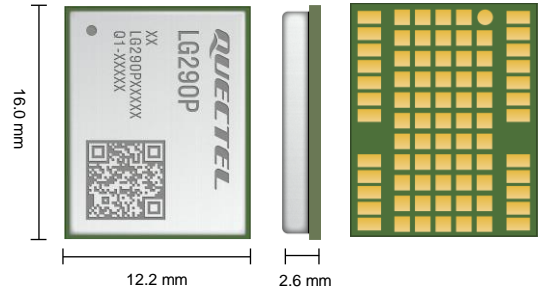


# Quectel LG290P (03)

## 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 (WASS, EGNOS, BDSBAS, MSAS, GAGAN and SDCM). The module supports Quad-band RTK with fast convergence time and reliable performance.

An integrated professional-grade interference signal detection and elimination algorithms effectively mitigates against multiple narrow-band interference sources which significantly improves signal reception performance, particularly in complex electromagnetic environments. The LG290P (03) module supports multi-mode and Quad-band RTK algorithm solutions, ensuring fast and reliable high-precision RTK positioning in complex scenarios such as urban environments and deep tree cover.

LG290P (03) supports protection-level and other integrity detection information, aiding control decisions in automatic navigation application scenarios. With on-chip storage ECC verification and Secure Boot safe loading mode, the module protects the operating firmware safety. The LG290P (03) accommodates users diverse needs with a choice of interfaces including UART and I2C\*.

With its performance advantages of high-precision and low power consumption, LG290P (03) has emerged as an ideal choice for high-precision navigation application scenarios, such as intelligent robots, precision agriculture, mining, surveying and mapping as well as autonomous driving.



## Key Features

- ✓ Multi-GNSS constellation for GPS, GLONASS, Galileo, BDS, QZSS and NavIC
- ✓ SBAS system (WASS, 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\*
- ✓ 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

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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	
Supported Bands	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
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 <sup>①</sup> : 0.7 m RTK <sup>②</sup> : 0.8 cm + 1 ppm
Vertical Accuracy	Autonomous <sup>①</sup> : 2.5 m RTK <sup>②</sup> : 1.5 cm + 1 ppm
Velocity Accuracy <sup>③</sup>	Without Aid: 0.03 m/s
Accuracy of 1PPS Signal <sup>③</sup> (1σ)	5 ns
RTK Convergence Time <sup>②</sup>	5 s
TTFF <sup>③</sup> (without AGNSS)	Cold Start: 28 s Warm Start: 28 s Hot Start: 1.7 s
Sensitivity <sup>④</sup> (@ Default Constellations)	Acquisition: -146 dBm Tracking: -160 dBm Reacquisition: -155 dBm
Dynamic Performance <sup>③</sup>	Maximum Altitude: 10000 m Maximum Velocity: 490 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 <sup>⑤</sup>
Antenna Power Supply	External or Internal (through VDD_RF)
Electrical Characteristics	
Supply Voltage Range (VCC)	3.0–3.6 V, Typ. 3.3 V
I/O Voltage	Following VCC
Power Consumption <sup>③</sup> (@ 3.3 V, Default Constellations)	<b>Normal Operation:</b> 99 mA (326.7 mW) @ Acquisition 99 mA (326.7 mW) @ Tracking <b>Power Saving Mode:</b> 12 μA (39.6 mW) @ Backup Mode

NOTE:

\*: Under development.

- ①: CEP; 50 %; instrument configuration: GPS L1 + L5, Galileo E1 + E5a and BDS B1I + B2a; static 24 h; -130 dBm.
- ②: CEP, 50 %, with active high-precision antenna in an open-sky environment and within 1 km of the base station.
- ③: Tested at room temperature, with typical operating voltage, and satellites signal of -130 dBm configured by the instrument.
- ④: Tested with two external LNA with 18.5 dB gain and 0.85 dB noise figure (During the sensitivity test of tracking, ensure that there are no less than 12 satellites for GPS L1 and L5, 10 satellites for BDS B1I and B2a, and 10 satellites for Galileo E1 and E5a).
- ⑤: To further mitigate the impact of out-of-band signals on GNSS module performance, you must choose the active antenna whose SAW filter is placed in front of the LNA in the internal framework. DO NOT place the LNA in the front.