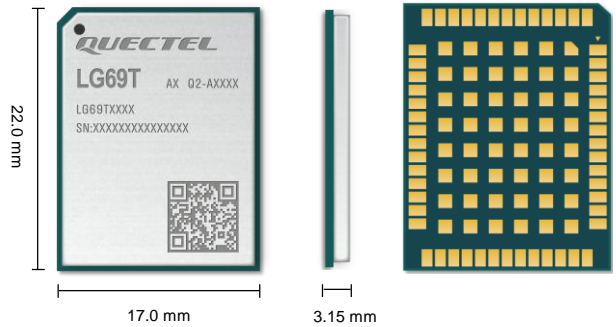


Quectel LG69T

Automotive Grade Dual-Band Multi-Constellation GNSS Module Integrating DR/RTK



The LG69T module features the fifth generation of STMicroelectronics® positioning receiver platform, with 80 tracking channels and 4 fast acquisition channels, compatible with up to 4 constellations: GPS, Galileo, BeiDou and QZSS. It is a dual-band GNSS module integrated with RTK and Dead Reckoning technology that enables best performance for a variety of applications. The module is designed and manufactured according to the Quality Management System based on IATF 16949:2016 Standard.

With the dead reckoning capabilities and an integrated inertial measurement unit (IMU), the LG69T (AA) provides continuous meter-level positioning (without RTK corrections). The integrated state-of-the-art algorithms fuse between the IMU data, GNSS measurements, wheel ticks and vehicle dynamics models, to provide accurate positioning in areas where GNSS alone would fail. It is ideal for vehicle markets such as automotive navigation, ADAS, V2X.

The LG69T (AM) supports standard RTCM correction from third-party base stations to reach centimeter-level navigation in seconds. It works up to 10 Hz navigation rate and is perfect for applications such as robotics, agriculture and surveying.

The module is designed for easy integration with minimal e-BOM. There is no need for an external powerful co-processor. Due to its small package size and light weight, it is well-suited for mass market adoption.



Key Features

- ✓ Concurrent reception of GPS, Galileo, BeiDou and QZSS constellations
- ✓ Centimeter-level accuracy with fast convergence time and outstanding performance (LG69T(AM))
- ✓ No need for external co-processor
- ✓ GNSS raw data output up to 10 Hz
- ✓ Integrated LNA for improved sensitivity
- ✓ Supports DR algorithms (LG69T (AA))
- ✓ Designed and manufactured according to the Quality Management System based on IATF 16949:2016 Standard



L1 + L5
Dual Bands



Multi-Constellation
System



Low Power Consumption



DR



RTK



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



RoHS Compliant

Quectel LG69T

GNSS Module	LG69T (AD)*	LG69T (AA)*	LG69T (AM)*
Dimensions (mm)	22.0 × 17.0 × 3.15	22.0 × 17.0 × 3.15	22.0 × 17.0 × 3.15
Weight (g)	Approx. 1.9	Approx. 1.9	Approx. 1.9
Temperature Range			
Operating Temperature	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Storage Temperature	-40 °C to +90 °C	-40 °C to +90 °C	-40 °C to +90 °C
GNSS Features			
Supported Bands	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BeiDou: B1I; B2a	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BeiDou: B1I; B2a	GPS: L1 C/A; L5 Galileo: E1; E5a BeiDou: B1I; B2a
Function(s)	PVT ^① /GNSS raw data ^② *	DR/GNSS raw data ^② + IMU raw data	RTK ^③
Integrated IMU	-	Supported	-
Default GNSS Constellations	GPS + BeiDou + Galileo + QZSS	GPS + BeiDou + Galileo + QZSS	GPS + BeiDou + Galileo
Channels	80 Tracking Channels 4 Fast Acquisition Channels	80 Tracking Channels 4 Fast Acquisition Channels	80 Tracking Channels 4 Fast Acquisition Channels
SBAS*	WAAS, EGNOS, MSAS and GAGAN	WAAS, EGNOS, MSAS and GAGAN	-
Horizontal Position Accuracy	Autonomous ^④ : 1 m	Autonomous ^④ : 1 m	Autonomous ^④ : 1 m RTK ^⑤ : 0.1 m + ppm
Velocity Accuracy^⑥	Without Aid: 0.1 m/s	Without Aid: 0.1 m/s	Without Aid: 0.1 m/s
Acceleration Accuracy^⑥	Without Aid: 0.1 m/s ²	Without Aid: 0.1 m/s ²	Without Aid: 0.1 m/s ²
Convergence Time	-	-	RTK ^⑤ : TBD
Accuracy of 1PPS Signal^⑦	100 ns	100 ns	100 ns
TTF (with AGNSS)	Warm Start: TBD	Warm Start: TBD	-
TTF (without AGNSS)^⑧	Cold Start: 36 s Warm Start: 30 s Hot Start: 3 s	Cold Start: 36 s ^⑧ Warm Start: 30 s ^⑧ Hot Start: 3 s ^⑧	Cold Start: 36 s ^⑧ Warm Start: 30 s ^⑧ Hot Start: 3 s ^⑧
Sensitivity (@ Default Constellations)^⑨	Acquisition: -145 dBm Tracking: -160 dBm Reacquisition: -153 dBm	Acquisition: -145 dBm ^⑩ Tracking: -160 dBm ^⑩ Reacquisition: -153 dBm ^⑩	Acquisition: -145 dBm ^⑩ Tracking: -160 dBm ^⑩ Reacquisition: -153 dBm ^⑩
Dynamic Performance^⑩	Maximum Altitude: 18000 m Maximum Velocity ^⑩ : 515 m/s Maximum Acceleration ^⑩ : 4.0g	Maximum Altitude: 18000 m Maximum Velocity ^⑩ : 515 m/s Maximum Acceleration ^⑩ : 4.0g	Maximum Altitude: 18000 m Maximum Velocity ^⑩ : 515 m/s Maximum Acceleration ^⑩ : 4.0g
Update Rate (Max.)	PVT ^① : 1 Hz GNSS raw data*:10 Hz	PVT ^① : 1 Hz GNSS raw data: 10 Hz IMU raw data: 100 Hz	PVT ^① : 10 Hz
Interfaces			
UART Interface	× 2 Adjustable: 115200–921600 bps Default: 115200 bps	× 2 Adjustable: 115200–921600 bps Default: 460800 bps	× 2 Adjustable: 115200–921600 bps Default: 460800 bps
Protocols			
Protocols	NMEA 0183/RTCM 3.x	NMEA 0183/RTCM 3.x	NMEA 0183/RTCM 3.x
External Antenna Interface			
Antenna Type	Active	Active	Active
Antenna Power Supply	External or Internal (through VDD_RF)	External or Internal (through VDD_RF)	External or Internal (through VDD_RF)
Electrical Characteristics			
Supply Voltage Range	3.0–3.6 V, Typ. 3.3 V	3.0–3.6 V, Typ. 3.3 V	3.0–3.6 V, Typ. 3.3 V
I/O Voltage	Typ. 3.3 V	Typ. 3.3 V	Typ. 3.3 V
Current Consumption (@Default Constellations, 3.3 V)	Normal Operation: 219 mA @Acquisition 216 mA @Tracking Power Saving Modes: 55 µA @Backup	Normal Operation: 242 mA @Acquisition 237 mA @Tracking Power Saving Modes: 55 µA @Backup	Normal Operation: TBD @Acquisition TBD @Tracking Power Saving Modes: TBD @Backup
Certifications			
Regulatory	Europe: CE*	Europe: CE*	Europe: CE*
Others	RoHS	RoHS	RoHS
Quality & Reliability			
Quality & Reliability	Manufactured and fully tested in ISO/TS 16949 certified production sites	Manufactured and fully tested in ISO/TS 16949 certified production sites	Manufactured and fully tested in ISO/TS 16949 certified production sites

NOTE:

- ^① PVT stands for Position, Velocity and Time
- ^② DR function and GNSS raw data are supported by different firmware versions
- ^③ Measured by using active high-precision antennas in an open-sky environment and within 1 km from the base station
- ^④ CEP, 50%, 24 hours static, -130 dBm, more than 6 SVs
- ^⑤ Room temperature, all satellites at -130 dBm
- ^⑥ Preliminary data
- ^⑦ Demonstrated with a good external LNA
- ^⑧ ITAR limits
- ^⑨ * Under development/planning
- ^⑩ - Unsupported