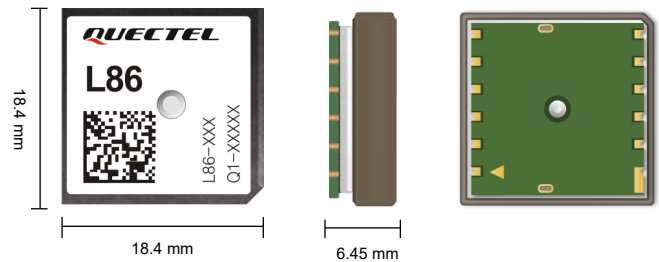




Quectel L86

Compact GNSS Module Embedded Patch Antenna



The L86 is an ultra-compact GNSS POT (Patch on Top) module with an embedded 18.4 mm × 18.4 mm × 4.0 mm patch antenna and utilizes the MediaTek GNSS chipset MT3333 of the new generation. Designed to be compatible with Quectel GPS L80 module with its compact and unified form factor, the module provides a flexible and scalable platform for migrating from GPS to GNSS. This space-saving design makes the L86 a perfect module for miniature devices. Equipped with its LCC package and integrating patch antenna, the L86 has exceptional performance both in acquisition and tracking.

Combining advanced AGNSS technology, EASY (Embedded Assist System) and proven AlwaysLocate technologies, the L86 achieves the highest performance and fully meets the industrial standard. The EASY technology allows the L86 to calculate and predict orbits automatically using the ephemeris data (of up to 3 days) stored in internal RAM memory. As a result, the L86 can fix position quickly even at indoor signal levels with low power consumption. With AlwaysLocate technology, the L86 can adaptively adjust the on/off time to achieve balance between positioning accuracy and power consumption according to the environmental and motion conditions.

The L86 module supports automatic antenna switching function and short circuit protection function. The module can achieve the switching between internal patch antenna and external active antenna, while keeping positioning during the switching process.

Due to its compact design, high precision and sensitivity, the L86 is perfectly suitable for a broad range of M2M applications such as portable device, automotive, personal tracking, smart safety, and industrial PDA. Besides, the module is especially suitable for special applications, like GPS mouse and OBD.



Key Features

- ✓ Multi-constellation GNSS engine for GPS, GLONASS and QZSS
- ✓ Embedded patch antenna: 18.4 mm × 18.4 mm × 4.0 mm
- ✓ Extremely compact size: 18.4 mm × 18.4 mm × 6.45 mm
- ✓ Automatic antenna switching function
- ✓ Short circuit protection and antenna detection
- ✓ Built-in LNA for better sensitivity
- ✓ EASY, an advanced AGNSS technology without external memory
- ✓ Ultra-low power consumption: 26 mA @ Tracking
- ✓ AlwaysLocate, an intelligent controller of the periodic mode
- ✓ LOCUS, an embedded logger function that doesn't require host or external flash
- ✓ High sensitivity: -167 dBm @ Tracking, -149 dBm @ Acquisition
- ✓ 99 acquisition channels, 33 tracking channels
- ✓ Balloon mode in high altitudes (up to 80 km)
- ✓ DGPS and SBAS (WAAS/EGNOS/MSAS/GAGAN) technologies
- ✓ Anti-jamming, multi-tone active interference canceller
- ✓ 1PPS for time service
- ✓ SDK commands developed by Quectel



Embedded
Patch Antenna



EASY Technology



Low Power
Consumption



Tracking Sensitivity:
-167 dBm



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



High Accuracy



Anti-Jamming



GPS/GLONASS/
QZSS



RoHS

Version: 1.6 | Status: Released

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GNSS Features

Receiving Bands:

GPS L1 C/A: 1575.42 MHz

GLONASS L1 C/A: 1601.71 MHz

Channel:

33 Tracking Channels

99 Acquisition Channels

SBAS:

WAAS, EGNOS, MSAS, GAGAN

Horizontal Position Accuracy:

Autonomous: < 2.5 m CEP

Velocity Accuracy:

Without Aid: < 0.1 m/s

Acceleration Accuracy:

Without Aid: < 0.1 m/s²

Reacquisition Time: < 1 s

TTFF @ -130 dBm with EASY:

Cold Start: < 15 s

Warm Start: < 5 s

Hot Start: < 1 s

TTFF @-130 dBm without EASY:

Cold Start: < 35 s

Warm Start: < 30 s

Hot Start: < 1 s

Sensitivity:

Acquisition: -149 dBm

Tracking: -167 dBm

Reacquisition: -161 dBm

Dynamic Performance:

Maximum Altitude: Max. 18000 m

Maximum Velocity: Max. 515 m/s

Maximum Acceleration: 4g

Interfaces

UART Interface:

Adjustable 4800–115200 bps

Default: 9600 bps

Update Rate:

1 Hz (Default), up to 10 Hz

I/O Voltage:

2.7–2.9 V

Protocols:

NMEA 0183

PMTK

1 mA @ Standby Mode

Periodic Mode

Note:

① Measured with GPS + GLONASS System in Outdoor Static Mode.

General Features

Extended Temperature:

-40 °C to +85 °C

Dimensions:

18.4 mm × 18.4 mm × 6.45 mm

Weight:

Approx. 7.6 g

Power Management

Power Supply:

2.8–4.3 V, Typ. 3.3 V

Power Acquisition:

30 mA @ 3.3 V (GPS + GLONASS)

Power Tracking:

26 mA @ 3.3 V (GPS + GLONASS)

Power Saving:

3.5 mA @ AlwaysLocate^①

7 μA @ Backup Mode