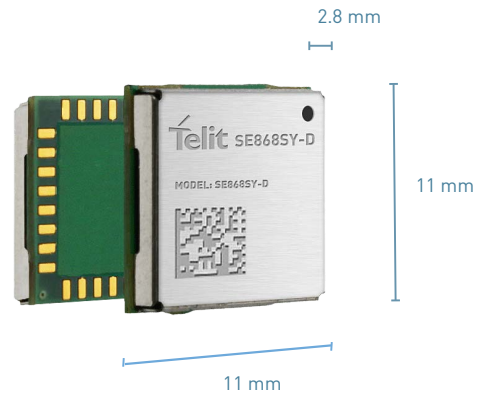


# SE868SY-D

**GNSS** Embedded



## Product Description

The SE868SY-D is a new multi-frequency and multi-constellation positioning receiver module that combines GPS/QZSS and Galileo in the L1/E1 and L5/E5 bands, GLONASS in the L1 and BeiDou in the B1 and B2 bands, IRNSS in the L5 band and SBAS, to provide improved performances for position reporting and navigation solutions. The use of two frequencies (L1/E1 and L5/E5) improves the location accuracy and greatly reduces multi-path effects in urban areas.

The SE868SY-D can navigate to -161 dBm and track to -165 dBm, providing improved performance in harsh environments. It is pin-out compatible with the SE868 V3 as well as the JF2 and the SE868 V2. It can track GPS, GALILEO, IRNSS, and GLONASS or BeiDou constellations simultaneously and it is BeiDou L5 band ready, providing the host device with high-value benefits from multi-constellation and multi-frequency navigation.

The SE868SY-D is encased in an 11 x 11 mm QFN-like package, includes a powerful baseband processor, embedded Flash memory and integrated LNA. Its ultra-sensitive RF front-end and multi-frequency and multi constellation capability enable high-quality navigation in challenging outdoor scenarios such as dense urban areas. The SE868SY-D delivers navigation data over a serial interface according to the NMEA protocol standard. Its low power processing core delivers optimized multi-constellation tracking with industry's best power consumption.

The SE868SY-D supports ephemeris file injection (A-GNSS) as well as Satellite Based Augmentation System (SBAS) to increase position accuracy and improve time-to-first-fix (TTFF). Its onboard software engine can predict local short-term ephemeris starting from ephemeris data broadcast by GNSS satellites received by the module and stored in the internal Flash memory.

## Key Benefits

- Same Form Factor as JF2 and SE868 V3
- Full GNSS compliance: GPS, GLONASS, Galileo, BeiDou and IRNSS/NAVIC
- Dual-frequency for improved performances
- Best-in-class power consumption
- Ultra-sensitive -165 dBm (tracking) RF front-end
- Embedded LNA allows use of passive antennas
- Supports ephemeris file injection (A-GNSS)
- Satellite Based Augmentation System (SBAS) compliant

## Family Concept

The Telit positioning product portfolio is the result of over twenty years of experience in GNSS applications. Our current product offering ranges from GPS-only and multi-constellation receivers, to the best in class multi-frequency module.

The SE868 family offers a broad series positioning solutions and customizations in a compact 11 x 11 mm form factor, and the integrated Telit proprietary commands allow for an easy transition between different variants. These unified command-set reduces development complexity without additional costs.

Typical applications include fleet management systems, e-mobility applications, road tolling systems, cellular base stations, automotive telematics systems, and wearables sports training monitors.

**Complete,  
Ready-to-Use Access  
to the Internet of Things**



## SE868SY-D

### Product Features

- Frequency Band: GPS L1 and L5, Galileo E1 and E5, Glonass L1, BeiDou B1 and B2, and IRNSS L5
- 62 physical acquisition/tracking channels
- Standards: NMEA
- Jamming rejection
- Low Power Modes
- A-GNSS: ephemeris file injection
- Telit proprietary PTWS commands
- EGNOS, WAAS, GAGAN and MSAS capability embedded with correction of positional errors due to ionospheric and orbital disturbances

### Environmental

- Dimensions: 11 x 11 x 2.8 mm
- Weight: 1 g
- 32-pad QFN-like package
- Temperature range
  - Operating temperature: -40 to +85°C
  - Storage temperature: -40 to +85°C

### Interfaces

- UART, I<sup>2</sup>C and SPI\*\* interfaces
- PPS for precise timing

\*\*roadmap

### Approvals

- RoHS compliant
- RED, UKCA

### Electrical & Sensitivity

- Power supply
  - From 1.71 V up to 1.89 V
  - From 0.75 V up to 0.85 (Low Power variant)
- Power consumption: L1+L5, Full Power, 1Hz
  - Acquisition: 60 mW / 40 mW<sup>1</sup>
  - Tracking: 47 mW / 34 mW<sup>1</sup>
  - Deep Sleep: 70 uW / 50 uW<sup>1</sup>
- Power consumption: L1, Full Power, 1Hz
  - Acquisition: 53 mW / 38 mW<sup>1</sup>
  - Tracking: 25 mW / 20 mW
  - Deep Sleep: 70 uW / 50 uW<sup>1</sup>
- Sensitivity: L1+L5
  - Acquisition: -147 dBm
  - Navigation: -161 dBm
  - Tracking: -164 dBm
- Horizontal positional accuracy: L1+L5
  - CEP50 < 1 m
- Timing Accuracy (1PPS)
  - Jitter: <10 ns @1-sigma
- Time To First Fix (90% @ -130 dBm): L1+L5
  - Hot start: 1 s
  - Cold start: < 24 s

<sup>1</sup>low power Variant

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