

PRELIMINARY

SE868K5-RTK

GNSS



Product Description

The SE868K5-RTK is a multifrequency and multiconstellation positioning receiver module with Real Time Kinematics (RTK) capabilities and a member of the xE868 Telit form factor family.

Using two frequencies (i.e., L1/E1 and L5/E5) enhances location accuracy and reduces multipath effects in urban areas.

In addition to its standard capabilities, with the injection of differential corrections, the SE868K5-RTK can achieve centimeter level accuracy.

The SE868K5-RTK is pin-out compatible with the SE868SY and SE868K5 families, as well as with the legacy products JF2 and SE868 V3.

The SE868K5-RTK is encased in an 11 x 11 mm QFN-like package. It includes:

- A powerful baseband processor
- Embedded memory and PSRAM
- Integrated LNA for optimal performance
- SAW filter for improved coexistence
- Switching regulator for best consumption

Its compact design and optimized positioning engine enable high-quality navigation in the majority of scenarios, whilst its RTK capabilities deliver exceptional performances for precision agriculture, drones, e-mobility, and all high-precision applications.

The SE868K5-RTK reports navigation data over a serial interface (i.e., UART, I2C and SPI*) according to the NMEA protocol standard. Also, it supports the output of raw measurements for high-precision applications (RTCM 3.x).

The SE868K5-RTK supports ephemeris file injection (A-GNSS) and local prediction of short-term ephemerides for faster time to first fix (TTFF). It also supports SBAS or QZSS L1S signals for further increasing position accuracy.

Key Benefits

- Real Time Kinematics support up to 10 Hz (RTCM 3.x input)
- Footprint compatible with SE868K5 family, with SE868SY family, and with legacy JF2 and SE868V3 variants
- Full GNSS compliance: GPS, GLONASS, Galileo, BeiDou and QZSS
- SAW filter for optimal coexistence with other radios
- Embedded LNA allows optimal performance even with passive antennas
- Supports ephemeris file injection (A-GNSS) as well as on-board ephemeris prediction (A-GPS)



Family Concept

Telit's positioning product portfolio is the result of over 20 years of experience in GNSS applications. Our product offering ranges from GPS-only and multiconstellation receivers to the best-in-class multifrequency modules. The SE868 family offers a broad series of positioning solutions and customizations in a compact 11 x 11 mm form factor. The integrated Telit proprietary commands enable easy transition between variants. These unified command sets reduce development complexity without additional costs.

Typical applications include:

- Fleet management systems
- E-mobility applications
- Lawn mowers / robots
- Precision Agriculture
- Automotive telematics systems
- Drones

Product Features

- 32-pad QFN-like package
- Frequency bands: GPS/QZSS L1 + L5, Galileo E1 + E5, GLONASS L1, BeiDou B1 + B2
- 75 (L1-band) / 60 (L5-band) tracking channels
- Standards: NMEA/RTCM
- Jamming rejection
- Support for RTK differential corrections (RTCM input)
- A-GNSS: Self-generated prediction and ephemeris file injection
- Up to 10 Hz update rate
- Telit proprietary PTWS commands
- EGNOS, WAAS, GAGAN and MSAS capability embedded with positional error correction for augmented accuracy and integrity
- Embedded SAW for optimal coexistence and LNA for improved performance
- Raw measurements output in RTCM format for high-accuracy applications

Environmental

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

Interfaces

- UART, I2C and SPI* interfaces
- A pulse per second (1PPS) output for precise timing

Approvals

- RoHS compliant
- RED

Electrical & Sensitivity*

- Power supply:
 - From 1.72 V up to 1.89 V
- Power consumption (G3BQ): L1 + L5, full power, 1Hz at 1.8 V
 - Acquisition: ~70mW (with RTK at 1Hz)
 - Tracking/Navigation: ~70mW (with RTK at 1Hz)
 - RTC mode: 36 µW (typical)
- Sensitivity (G3BQ): L1 + L5
 - Acquisition: -146 dBm
 - Tracking and Navigation: -165 dBm
- Horizontal positional accuracy:
 - CEP50: < 1 m / 1 cm (with RTK)
- Time to first fix (90% @ -130 dBm):
 - Hot start: 1 s
 - Warm start: 18 s
 - Cold start: 28 s

**Preliminary values on early samples*

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