PRELIMINARY

SE869eK5-DR

GNSS

Product Description

The SE869eK5-DR is a multiconstellation, dual-frequency positioning receiver and member of the xE869 series. It integrates an accurate inertial measurement unit (IMU) for dead reckoning capabilities.

The receiver uses two frequencies (i.e., L1/E1 and L5/E5) to enhance location accuracy and reduce multipath effects in urban areas. It provides reliable performance and relays continuous positioning information even when satellite signal is unavailable.

The SE869eK5-DR offers the same performance as the SE868K5-DR in a 16 x 12.2 x 2.3 mm industry-standard form factor for broader capabilities.

The receiver includes:

- A six-axis IMU
- Embedded memory and pseudostatic random-access memory (PSRAM)
- Integrated LNA for optimal performance
- An integrated low noise amplifier (LNA) for optimal performance
- A Band 13 filter for improved coexistence
- A switching regulator for best consumption

Its optimized positioning engine enables high-quality navigation in most scenarios. The dead reckoning feature provides reliable, continuous positional information for applications that require uninterrupted response.

The SE869eK5-DR reports navigation data over serial interfaces, including:

- Universal asynchronous receiver-transmitter (UART)
- Inter-Integrated Circuit (I2C)
- Serial peripheral interface (SPI)

It follows the National Marine Electronics Association (NMEA) protocol standard.

In addition, it supports raw measurement output for high-precision applications. This feature conforms to the Radio Technical Commission for Maritime Services (RTCM) data format (i.e., RTCM 3.x).

This receiver supports ephemeris file injection with assisted GNSS (A-GNSS) and local prediction of short-term ephemerides for faster time to first fix (TTFF). It also supports satellite-based augmentation systems (SBAS) or QZSS L1S signals to increase position accuracy further.

Key Benefits

- Untethered dead reckoning (UDR) support with integrated IMU sensor
- Footprint compatible with the SL869 series and the industry standard
- Full GNSS compliance: GPS, GLONASS, Galileo, BeiDou, QZSS and NavIC
- SAW and Band 13 filters for optimal coexistence with other radios
- Embedded LNA allows optimal performance even with passive antennas
- Supports ephemeris file injection with A-GNSS and onboard ephemeris prediction with assisted GPS (A-GPS)

Family Concept

Telit Cinterion's positioning product portfolio is the result of over 30 years of GNSS application experience. Our offerings range from GPS-only and multiconstellation receivers to best-in-class multifrequency modules.

The SE869eK5-DR is an evolution of the SL869 series. It moves from an LCC to an LGA package and adds features through the additional connection pins.

Telit Cinterion's integrated proprietary commands enable an easy transition between variants. These unified command sets reduce development complexity without adding costs.

Applications include:

- Fleet management systems
- Asset trackers
- Automotive telematics systems

Telit Cinterion

PRELIMINARY

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Product Features

- 58-pad LGA package
- Frequency bands: GPS/QZSS L1 + L5, Galileo E1 + E5, GLONASS L1, BeiDou B1 + B2, NavIC L5
- 75 (Band L1)/60 (Band L5) tracking channels
- Standards: NMEA and RTCM
- Jamming rejection and anti-spoofing*
- Support for UDR
- A-GNSS: Self-generated predictions and ephemeris file injection
- Up to 10 Hz update rate
- Telit Cinterion proprietary PTWS commands
- EGNOS, WAAS, GAGAN and MSAS capabilities embedded with positional error correction for augmented accuracy and integrity
- Embedded LNA and B13 filter for optimal coexistence and improved performance
- Raw measurements output in RTCM format for high-accuracy applications
- DGNSS support for submeter accuracy
- RTK support on dedicated variant*

Environmental

- Dimensions: 16 x 12.2 x 2.3 mm
- Weight: 1.5 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 2.8 V up to 3.6 V
- Power consumption (G3BQ): L1 + L5, full power, 1Hz at 3.3 V
  - Acquisition: 70 mW
  - Tracking and navigation: 75 mW
  - RTC mode: 65 µW (typical)
- Sensitivity (G3BQ): L1 + L5
  - Acquisition: -145 dBm
  - Tracking and navigation: -164 dBm
- Horizontal positional accuracy:
  - CEP50: < 1 m
- TTFF (90% @ -130 dBm):
  - Hot start: 1 s
  - Warm start: 15 s
  - Cold start: 28 s

**Roadmap*

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[09.2025]