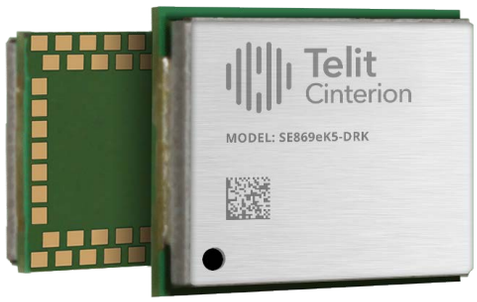
SE869eK5-DRK

GNSS



Product Description

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

Using two frequencies (i.e., L1/E1 and L5/E5) enhances location accuracy and reduces multipath effects in urban areas even without external corrections. This receiver can achieve cm-level precision through the injection of external RTK corrections and relays continuous positioning information even when the satellite signal is unavailable.

The SE869eK5-DRK combines the establisher performances of SE868K5-RTK and SE868K5-DR into a 16 x 12.2 mm industry standard form factor for broader compatibility. It includes:

- 6-axis Inertial Measurement Unit (IMU)
- Embedded memory and PSRAM
- Integrated LNA for optimal performance
- Band 13 filter for improved coexistence
- Switching regulator for best consumption

Its optimized positioning engine enables high-quality navigation in most scenarios. The combination of RTK capability and dead reckoning feature provides extremely accurate, reliable, continuous positional information for applications in which uninterrupted response is critical.

The SE869eK5-DRK reports navigation data over a serial interface (i.e., UART, I2C and SPI*) according to the NMEA protocol standard. In addition, it supports the output of raw measurements for high-precision applications (RTCM 3.x).

The SE869eK5-DRK 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

- Untethered dead reckoning (UDR) support with integrated IMU sensor
- Centimeter level precision via RTK and submeter precision via DGNSS corrections (RTCM 3.x supported)
- Footprint compatible with SL869 series and with 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 (A-GNSS) and onboard ephemeris prediction (A-GPS)

Family Concept

Telit Cinterion's positioning product portfolio results from over 30 years of experience in GNSS applications. Our offering ranges from GPS-only and multiconstellation receivers to best-in-class multifrequency modules.

The SE869e represents the evolution of the SL869 series, moving from LCC to LGA package and allowing the introduction of new features through the additional connection pins. Telit Cinterion's integrated proprietary commands enable easy transition between variants. These unified command sets reduce development complexity without additional costs.

Typical applications include:

- Fleet management systems
- Asset trackers
- Automotive telematics systems
- Precision Agriculture
- Robotic Lawn Mower

SE869eK5-DRK

Variants

	UDR	RTK	EMBEDDED IMU
SE869eK5-DR	Yes	No	Yes
SE869eK5-DRK	Yes	Yes	Yes

Product Features

- 58-pad LGA package
- Frequency bands: GPS/QZSS L1 + L5, Galileo E1 + E5, GLONASS L1, BeiDou B1 + B2, NavIC L5
- 75 (L1 band)/60 (L5 band) tracking channels
- Standards: NMEA/RTCM
- Jamming rejection and Anti-spoofing*
- Support for untethered dead reckoning
- A-GNSS: Self-generated prediction 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 for centimeter level accuracy

Environmental

- Dimensions: 16 x 12.2 mm
- Weight: 1.5 g (TBD)
- 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 2.55 V up to 5.25 V
- Power consumption (G3BQ): L1 + L5, full power, 1Hz at 3.3 V
  - Acquisition: < 80 mW
  - Tracking and navigation: < 80 mW
  - RTC mode: < 50 µW (typical)
- Sensitivity (G3BQ): L1 + L5
  - Acquisition: -146 dBm
  - Tracking and navigation: -165 dBm
- Horizontal positional accuracy:
  - CEP50: < 1 m (autonomous) / 0.01 m (RTK)
- Time to first fix (90% @ -130 dBm):
  - Hot start: 1 s
  - Warm start: 18 s
  - Cold start: 26 s

**Roadmap*