



SPK-GGGBD-M1514 Discrete GPS Module

For IoT sensors, wearable devices, mobile device/gaming, asset tracking and automotive



Description and highlights

SPK-GGGBD-M1514 utilizes SiRFstarV™ and features Quad-GNSS for tracking GPS, GLONASS, BDS and Galileo satellites. The product delivers accurate continuous location, advanced power management and high interference immunity. These continue to push the envelope of performance in sensitivity, TTFF and urban canyon availability and accuracy. With a built-in DSP and extremely low power consumption, the family can get fast location fixes for geo-tagging images or videos, asset tracking and wearable applications.

Advanced low power technology means there is no need to maintain full power to achieve maximum performance nor turning the GNSS receiver completely off to save power. It breaks old GNSS performance vs. power trade-off through the fusion of a new high-performance GNSS engine, advanced power management and a smart sensor interface to achieve high sensitivity hot-start conditions for fast location fixes.

Special power modes (Push-to-Fix™) are ideally suited for camera and asset tracking use cases. Push-to-Fix™ is an intelligent periodic low power mode that can adaptively

change power depending on the environment and motion conditions. Advanced algorithms and a powerful on chip DSP processor maintain high accuracy (QoS) while achieving the lowest power level possible for the given environmental and motion conditions. Data logging can be achieved with a very low energy-per-fix and completely independent of the host processor, which could be powered off.

Dynamic contextual awareness, temperature monitoring and MEMS sensors work in concert to conserve power and boost performance. This opens up a wide variety of use cases for sports cameras, asset tracking and fitness devices.

Premium on-chip software provides a new level of continuous location awareness by employing the following advanced technology:

- Advanced power management allows the GNSS receiver to stay in a hot-start condition nearly continuously while consuming very little power
- Local or server generated ephemeris prediction from three days to one month in advance boost sensitivity and performance.



KeyFeatures

High Performance Solution

- Quad-GNSS: GPS and GLONASS, Galileo and BDS with future firmware update. Improving availability and accuracy of position solutions in urban canyon environments.
- High sensitivity navigation engine(PVT) tracks as low as -165dBm GPS, -163dBm GLONASS
- Concurrent tracking of multi-satellite constellations
- SBAS (WAAS, EGNOS, QZSS, MSAS, GAGAN)

Advanced Navigation Features

- MEMSaiding (accelerometer, gyroscope, compass, barometer) enables context awareness and improves smoothness and accuracy of position solutions
- CSR InstanFix™ extended ephemeris

Breakthrough Low Power Technology

- SiRF Aware™ maintains hot start capability with ultra-low power
- Push-to-Fox™ can adaptively reduce power depending on the environment and motion conditions
- TricklePower™ mode requires
- TricklePowerII™ adaptive modes to reduce continuous tracking power

Cellular Coexistence

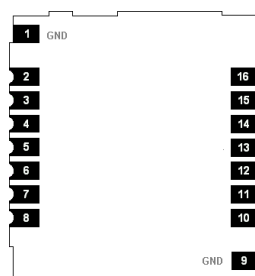
- Excellent 3GPP acquisition and tracking margins
- Designed for coexistence with 2G, 3G and 4G LTE

Easy and Flexible Integration

- Direct to battery or 1.8V supply
- Low cost crystal support (option)
- Host I2C, SPI, UART supported
- Custom configuration settings
- Programmable I/O

Package Types

- Industrial SMD PCB with golden PADS
- Pin Counts: 16
- Dimension: 15 x 14 mm
- Height: 2.8 mm
- Green packaging with taping reel (RoHS compliant and no antimony or halogenated flame retardants)



Technical Specifications

Horizontal Positioning Accuracy ①

- Autonomous < 2.5 m

Velocity Accuracy ②

- Speed < 0.01 m/s
- Heading < 0.01°

Time To First Fix ③

- Host start ④ < 2 s
- Warm Start ⑤ < 20 s
- Cold Start < 30 s

Sensitivity

	GPS	GLONASS	BDS
• Acquisition	-146 dBm	-145 dBm	-142 dBm
• Tracking	-165 dBm	-162 dBm	-155 dBm
• Navigation	-162 dBm	-162 dBm	-155 dBm

Receiver

- Tracking L1, CA Code
- Channels 52
- Max update rate 5 Hz
- Max altitude/velocity < 60,000 ft / < 1,000 knots
- Protocol support NMEA, OSP

System Integration

- I/O Interface I2C, SPI, UART (defaulted)
- Extended I/O x2

Environmental Data, Quality, Reliability

- Operating temperature: -40°C to +85°C
- Storage temperature: -50°C to +95°C

① 50%, 24 hr static @ -130 dBm

② 50% @ 30 m/s

③ 50% @ -130 dBm, Fu 0.5 ppm, Tu +/- 2s, Pu 30Km

④ Commanded hot start

⑤ Commanded warm start

