TGS5000 wireless GPS chipset

Key features
- Complete, two-chip A-GPS solution designed and optimized for wireless terminals
- Supports standalone, MS-assisted and MS-based modes of operation
- Cellular modem air-interface independent with support for current and future standards
- Programmability supports evolving GPS algorithms through software upgrades
- Flexible design provides increased performance and low power consumption for greater accuracy and reliability

Specifically designed for wireless handsets, the TGS5000 chipset is a complete programmable solution for Assisted Global Positioning Services (A-GPS). Due to its high levels of integration, the TGS5000 offers a power-efficient solution that delivers faster, more accurate location-based services across a wider area. Manufactured on a 130-nanometer CMOS process, the TGS5000 saves on board space, reducing overall cost and allowing for greater flexibility for wireless handset manufacturers and service providers.

TI’s TGS5000 is a two-chip solution that consists of a proven baseband processor and RF receiver; both are in ultra-small chip scale packages to extend board space savings. The chipset is highly-integrated and includes the logic, memory, analog and software necessary for A-GPS implementation and testing. It is optimized for all current and developing standards such as GSM, GPRS, EDGE, CDMA, UMTS and WCDMA. To further ensure seamless worldwide operation, the TGS5000 operates in the standalone, MS-assisted or MS-based modes and has the ability to maneuver between modes as required.

The TGS5000 also interfaces with TI’s wireless chipsets, making design easy in systems that are based on the world’s most popular wireless solutions. Due to this, the TGS5000 will make an excellent companion for bringing precision location capabilities to the OMAP™ platform and TI’s range of TCS chipsets that address market segments ranging from voice-centric handsets to high-end multimedia smart phones and PDAs.
Together, these highly-integrated devices provide a complete solution for adding A-GPS functionality to digital cellular handsets. The programmable chipset is designed to support future A-GPS enhancements, enabling original equipment manufacturers (OEMs) to quickly update handsets as geolocation algorithms, standards and applications are developed.

**Ready for the future**

The TI TGS5000 solution provides all the advantages of A-GPS in a space-saving, power-efficient design. Among competing solutions, the TGS5000 stands out as a fast and accurate method of geolocation for a variety of applications. The speed and accuracy of the TGS5000 will also enable future capabilities that require even more robust geolocation such as navigation.

**Ease of implementation through TI support and systems expertise**

TI offers industry-leading devices and tools across the wireless communications market, making the development of systems based on the TGS5000 solution much easier and faster with the company’s in-depth support. TI’s A-GPS chipset flexibility and included software save in design effort and development time. This development support includes an evaluation module (EVM) with PC-based software for testing the TGS5000, along with the system itself. Lastly, design with the TGS5000 chipset is made even easier with complete documentation and assistance from the TI support team.

**TGS5000 chipset and typical cellular handset system**

The TGS5000 chipset interfaces with the TI TCS chipset solution, making design easy in systems that are based on the world’s most popular wireless solutions.
**A-GPS solution operation and features**

**Solution operation**

The TGS5000 offers seamless, worldwide operation through its support of the standalone, MS-assisted and MS-based modes. The solution also has the ability to intelligently transition between the various modes as required.

**Standalone:**
The TGS5000 determines location independently, without assistance from a server, and allows users to gain location information when not connected.

**MS-Assisted:**
The location server does final processing and determines location with measurement data from the TGS5000.

**MS-Based:**
The TGS5000 obtains satellite data, makes calculations, and determines location with assistance data from the location server.

**Solution benefits**

- Leveraging assistance data from the network results in performance for fast Time-To-First-Fix, accuracy and sensitivity
- Search strategy yields ultra-fast satellite acquisition time in standalone mode
- Cross-correlation detection and multipath mitigation algorithms optimize performance for wireless applications
- Power management hardware and software assure outstanding battery life in active and stand-by modes of operation
- A-GPS Engine to Host Engine interface allows greater flexibility in final system implementation
- A Master and Slave architecture gives full control to wireless terminal manufacturers
- Various operation and test modes allow system field and production testing
- Seamless, worldwide operation is assured through support of the major network standards
**Specifications**

**TWL5001 A-GPS baseband processor**
- ARM7 processor
- Integrated RAM
- UART external interface
- Programmable asynchronous external interface
- IS801/A12 compatible
- Power management software
- 7 mm x 7 mm Chip Scale Package
  (143 pins at 0.5-mm spacing)

**TRF5101 RF transceiver**
- LNA/Image-reject mixer
- Integrated Phase-locked loop and VCO tank circuit
- Single down-converter
- Integrated filter
- Integrated 4-bit A/D converter
- Programmable sleep and power down modes
- 4 mm x 4 mm Chip Scale Package
  (48 pins at 0.5-mm spacing)
- Integrated automatic gain control

**For more information**
To learn more about the TGSS000 chipset solution and TI’s other leading wireless products, [www.ti.com/gps](http://www.ti.com/gps)

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