



ATR0600, ATR0610, ATR0620

GPS Receiver Chipset

ANTARIS® Positioning Engine

The leading ANTARIS® GPS Engine, jointly developed by Atmel and u-blox, provides excellent navigation performance under dynamic conditions in areas with limited sky view like urban canyons, high sensitivity for weak signal operation without compromising accuracy, and support of DGPS and multiple SBAS systems like WAAS and EGNOS. The 16 parallel channels and 8192 search bins provide fast start-up times. The aiding functionality accelerates start-up times even further. The low power consumption and FixNOW™ power saving mode make this product suitable for handheld and battery-operated devices.



Overview

The ANTARIS GPS chipset consists of three IC's:

- ATR0600 RF front-end IC
- ATR0610 Low Noise Amplifier IC (optional use)
- ATR0620 Baseband IC

These chips comprise a complete GPS solution from antenna input to navigation data output. The ATR0620 contains the integrated ARM7TDMI, ROM for the GPS firmware and on-chip RAM. No additional active components (memory, voltage regulators, amplifiers, etc.) are required.

The power consumption is 100 mW in continuous operation with 1 position fix per second, allowing extended operating time. The internal Autonomous Power Manager (APM) controls the functional blocks of the receiver and powers down the parts of the receiver, which are not in use. Hence, the power consumption can be even further reduced without compromising GPS performance. Further benefits are its excellent RF jamming immunity and the high integration that allows GPS solutions on minimum board area (less than 400mm²). The computational power of the integrated ARM7 CPU core can be further utilized to implement user applications, allowing efficient designs without the need for an external host CPU.

Benefits

- High acquisition and tracking sensitivity
- Ultra-low power consumption
- Excellent GPS performance
 - Excellent navigation accuracy, even at low signal levels
 - Active multipath detection and removal
 - Fast Time-To-First-Fix (TTFF)
 - Accelerated TTFF with aiding functionality
- Maximum flexibility
 - Extensively configurable
 - Integration of user application software
- Immune to RF interference
- Small system footprint
- Reduced Bill of Material and system cost

Features

- 16 channel GPS receiver
- 8192 simultaneous time-frequency search bins
- 4 Hz position update rate
- DGPS and SBAS (WAAS, EGNOS) support
- FixNOW™ power saving mode
- Operating Voltage 2.7 to 3.3 V
- Industrial operating temperature range -40 to 85°C
- Tiny BGA, VFQFP and PLLP packages
- SuperSense firmware option

Support Products

AEK-LS-0 / AEK-LS-2 GPS Evaluation Kits

Use the ANTARIS Evaluation Kits to experience the power of the ANTARIS GPS Technology. For standard GPS functionality, use AEK-LS-0. For indoor GPS functionality with SuperSense firmware option, use AEK-LS-2.

ASK-LS Software Customization Kit

The ANTARIS Software Customization Kit enables you to implement your own code on the chipset. The Application Link Layer (ALL) of the ANTARIS GPS software offers a powerful API (Application Programmer's Interface) for fast and safe integration of your application code.

*your position
is our focus*



Receiver Performance Data

Receiver Type	16 channel, L1 frequency, C/A code	
Max. Update Rate	4 Hz	
Accuracy	Position	2.5 m CEP DGPS / SBAS 2.0 m CEP ¹
Start-up Times	Hot start	<3.5 sec
	Warm start	33 sec
	Cold start	34 sec
	Aided start	5 sec
Signal reacquisition	< 1 s	
Sensitivity	Acquisition	-140 dBm
	Tracking	-149 dBm
Timing Accuracy	RMS:	50 ns
	99%:	<100 ns
Dynamics	< 4 g	
Operational Limits	COCOM restrictions apply	

¹ Depends on accuracy of correction data of DGPS or SBAS service

For more detailed information on the GPS performance check the ANTARIS System Integration Manual.

ATR0610 – GPS LNA

Technology	Silicon Germanium (SiGe)
Power Supply	2.7 – 3.3 V
Power Consumption	< 10 mW
Gain	16 dB
Noise Figure	1.6 dB
Standby Current	500 nA
	Integrated power-up control Integrated output match
Package	PLL6P 1.6 mm x 2.0 mm

ATR0600 – RF Receiver IC

Technology	Silicon Bipolar 0.6µm
Power Supply	2.7 – 3.3 V
Power Consumption	50 mW
Standby Current	20 µA
Total Gain	95 dB
Noise Figure	< 6.9 dB
Package	VFQFP-N28 5 mm x 5 mm

ATR0620 – GPS Baseband IC

Technology	CMOS
Power Supply	2.3 – 3.6 V or 1.8 V Integrated LDO
Power Consumption	40 mW @ 1Hz navigation update
Processor	ARM7TDMI Core
GPS Core	16 channel GPS correlator GPS acquisition accelerator
RAM	Internal, 128 KB
ROM	Internal, 288 KB
Interfaces	3 USARTs, SPI Master / Slave 8 / 16 bit external bus 11 basic GPIOs 2 interrupt-capable GPIOs
Package	BGA 100 9 mm x 9 mm
Protocols	NMEA, UBX binary, RTCM

Interleaving multiple protocols via same serial interface is supported

Environmental Data

Operating Temp.	-40°C to 85°C
Storage Temp.	-40°C to 125°C

Ordering Information

ATR-LA-0-000-0 ATR0610	GPS LNA (Low Noise Amplifier) Contact the local Atmel Sales Office
	<u>Delivery Packing</u> 0 = Single samples 3 = Tape on reel (3000 pieces)
ATR-LR-0-000-0 ATR0600	RF Receiver IC Contact the local Atmel Sales Office
	<u>Delivery Packing</u> 0 = Single samples 6 = Tape on reel (6000 pieces)
ATR-LB-0-000-0 ATR0620	GPS Baseband IC Contact the local Atmel Sales Office
	<u>Delivery Packing</u> 0 = Single samples 2 = Tape on reel (2000 pieces)

Parts of this product are patent protected.

The specifications in this document are subject to change at u-blox' discretion. u-blox assumes no responsibility for any claims or damages arising out of the use of this document, or from the use of modules based on this document, including but not limited to claims or damages based on infringement of patents, copyrights or other intellectual property rights. u-blox makes no warranties, either expressed or implied with respect to the information and specifications contained in this document. u-blox does not support any applications in connection with active weapon systems, ammunition, life support and commercial aircraft. Performance characteristics listed in this document are estimates only and do not constitute a warranty or guarantee of product performance. The copying, distribution and utilization of this document as well as the communication of its contents to others without expressed authorization is prohibited. Offenders will be held liable for the payment of damages. All rights reserved, in particular the right to carry out patent, utility model and ornamental design registrations.

u-blox, the u-blox logo, the TIM type GPS module, Antaris, SuperSense, "your position is our focus", NavLox, u-center, FixNow and EKF are (registered) trademarks of u-blox AG. The u-blox software as well as the design of the LEA type modules is protected by intellectual property rights in Switzerland and abroad. Further information available at info@u-blox.com.