# TIM-LC

GPS Receiver Module
ANTARIS® Positioning Engine

The TIM-LC is an ultra-low power OEM GPS module suitable for active antennas to run standard PVT applications. It provides two 3V (5V TTL input compatible) serial ports and easy-to-use boot time configuration pins. The combination of lowest power consumption, cost-optimized architecture (no Flash EPROM inside) and innovative packaging technology makes the TIM-LC suitable for high-volume applications where small size, low cost and simplicity are key issues.
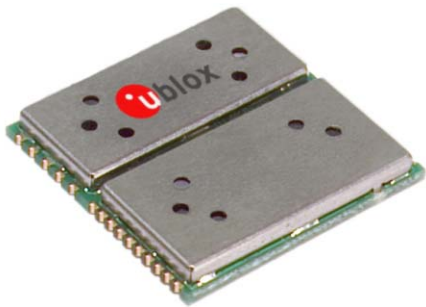
Overview

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.

Small Form Factor

Innovative packaging technologies enable high integration of a GPS receiver in a module component measuring just 25.4 x 25.4 mm and allowing straightforward integration in particularly small end products and opportunities in new application fields. The small form factor and the SMT pads allow a fully automatic assembly process with standard pick-and-place equipment and reflow soldering, enabling cost-efficient high-volume production.

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
- No Flash EPROM inside
  - Independence from memory market and price fluctuations
- Highly integrated GPS module
  - Automatic pick-and-place assembly
  - Reflow solderable
- Maximum flexibility
  - Extensively configurable
  - Boot-time configuration pins
- Fully EMI shielded
- Active antenna support

Features

- 16 channel GPS receiver
- 8192 simultaneous time-frequency search bins
- 4 Hz position update rate
- ANTARIS Positioning Engine
  - ATR0600 RF front-end IC
  - ATR0620 Baseband IC with ARM7TDMI inside
- DGPS and SBAS (WAAS, EGNOS) support
- FixNOW™ power saving mode
- Operating voltage 2.7 to 3.3 V
- Battery supply pin for internal backup memory and real time clock
- Industrial operating temperature range –40 to 85°C
- Small size: 25.4 x 25.4 x 3 mm, weight: 3g

Support Products

ANTARIS EvalKit

Use the ANTARIS EvalKit to experience the power of TIM-LC.
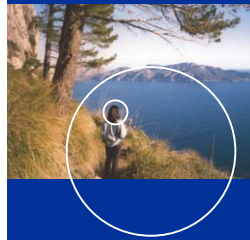
Specifications

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

Electrical Data

Power Supply	2.7 – 3.3 V
Power Consumption	typ. 141 mW @ 3.0 V
	typ. 127 mW @ 2.7 V
	Sleep mode: typ. 100 µA
Backup Power	1.95 V – 3.6 V
Serial Ports	2 UARTs @ 3 V levels
	5V TTL compatible input
Digital IOs	TIMEPULSE @ 1.8 V
Protocols	NMEA, UBX binary, RTCM
	Interleaving multiple protocols via same serial interface is supported
Interface	30 pin leadless chip carrier, reflow solderable
Antenna Power	External or Internal VCC_RF
Active Antenna Recommendations	Gain ≥ 25 dB
	Noise figure ≤ 1.5 dB
Antenna Supervision	Integrated short-circuit detection and antenna shutdown
	Open circuit detection is supported with little external circuitry

Environmental Data

Operating Temperature	-40°C to 85°C
Storage Temperature	-40°C to 125°C
Vibration	5 Hz to 500 Hz, 5g (IEC 68-2-6)
Shock	Half sine 30g / 11ms (DIN 40046-7)

Mechanical Data
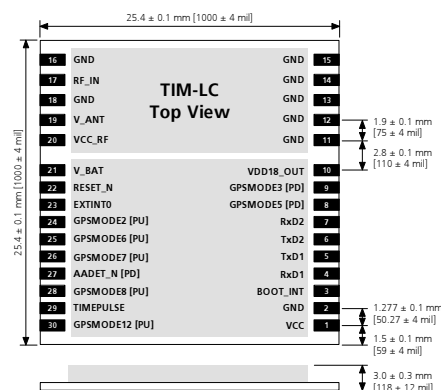
Ordering Information

TIM-LC-0-000-0   TIM-LC- GPS Receiver Module

Delivery Packing
0 = Single samples
1 = Tape on reel (100 pieces)
5 = Tape on reel (500 pieces)

AEK-LS-0-000-0   ANTARIS EvalKit - Evaluation Kit

Parts of this product are patent protected.