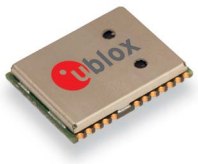
LEA-6T / NEO-6T

u-blox 6 timing GPS modules

Highlights

- Precision Timing:
  - 1 or 2 timepulse outputs (up to 10 MHz)
  - Single-satellite operation
  - Stationary (survey-in) mode for enhanced timing accuracy
  - Time mark of external event inputs
- Raw pseudo-range data output
- UART, USB and DDC (I²C compliant) interfaces
- Onboard RTC Crystal for faster warm and hot starts

LEA-6T:
17.0 x 22.4 x 2.4 mm



NEO-6T:
12.2 x 16.0 x 2.4 mm

Features

- u-blox 6 position engine:
  - Navigate down to –162 dBm and –148 dBm coldstart
  - Faster acquisition with AssistNow Autonomous
  - Hybrid GPS/SBAS engine (WAAS, EGNOS, MSAS)
  - Anti-jamming technology
- Simple integration with u-blox wireless modules
- A-GPS: AssistNow Online and AssistNow Offline services, OMA SUPL compliant
- Backward compatible (hardware and firmware); easy migration from LEA-5T or LEA-4T (LEA-6T)
- LCC package for reliable and cost effective manufacturing
- Optional upgradeable Firmware support
- Compatible with u-blox GPS Solution for Android
- Based on GPS chips qualified according to AEC-Q100
- Manufactured in ISO/TS 16949 certified production sites
- Qualified according to ISO 16750

Product description

The LEA-6T/NEO-6T modules provide precision GPS timing for demanding synchronization applications such as basestations. This module features user configurable frequency and timepulse outputs. An accuracy of up to 15 ns is achievable by using the quantization error information to compensate the granularity of the time pulse. LEA-6T/NEO-6T feature a time mode function whereby the GPS receiver assumes a stationary 3D position, whether programmed manually or determined by an initial self-survey.

During stationary operation GPS timing is possible with only one visible satellite. This means that time can be maintained even under adverse signal conditions or in environments with poor sky visibility. A built-in time mark and counter unit provide precise time measurement of external event inputs. T-RAIM (Timing Receiver Autonomous Integrity Monitoring) is available to detect faulty GPS measurements. LEA-6T/NEO-6T deliver raw pseudo-range data for survey and specialist applications.

LEA-6T/NEO-6T modules are manufactured in ISO/TS 16949 certified sites. Each module is tested and inspected during production. Qualification tests are performed as stipulated in the ISO16750 standard: “Road vehicles – Environmental conditions and testing for electrical and electronic equipment”.

Product selector

Model	Type							Supply		Interfaces				Features										
	GPS / QZSS	GLONASS	Galileo	BeiDou	Timing & Frequency	Dead Reckoning	Precise Point Positioning	1.65 V – 3.6 V	2.7 V – 3.6 V	UART	USB	SPI	DDC (I2C compliant)	Programmable (Flash)	Data logging	Extra front-end LNA	Front-end SAW filter	RTC crystal	Internal oscillator	Antenna supply	Antenna short circuit detection / protection	Antenna open circuit detection pin	Timepulse output	External interrupt / Wakeup
LEA-6T-0	•				•				•	•	•		•			•	•	•	T	•	o	o	•	•
LEA-6T-1	•				•				•	•	•		•	•		•	•	•	T	•	o	o	•	•
NEO-6T	•				•				•	•	•	•	•			•	•	•	T	o	o	o	•	•

o = Optional, not activated per default or requires external components

T = TCXO

Receiver performance data

Receiver type	50-channel u-blox 6 engine GPS L1 C/A code SBAS: WAAS, EGNOS, MSAS	
Navigation update rate	up to 5 Hz (2 Hz for LEA-6T-1)	
Accuracy	Position	2.5 m CEP
	SBAS	2.0 m CEP
Acquisition	Cold starts:	26 s
	Aided starts:	1 s
	Hot starts:	1 s
Sensitivity	Tracking:	–162 dBm
	Cold starts:	–148 dBm
	Hot starts:	–157 dBm

Timing performance data

Timing accuracy	RMS	30 ns
	99%	< 60 ns
	Granularity	21 ns
	Compensated	15 ns[1]

[1] Quantization error information can be used to compensate the granularity related error of the timepulse signal

Electrical data

Power supply	2.7-3.6 V
Power consumption	123 mW @ 3.0 V (LEA-6T) 120 mW @ 3.0 V (NEO-6T)
Backup power	1.4 V – 3.6 V, 22 µA
Supported Antennas	Active and passive
Antenna power	External or internal VCC_RF (LEA-6T)
Antenna supervision	Integrated short-circuit detection and antenna shutdown, open circuit detection with minimal external circuitry (LEA-6T)

Interfaces

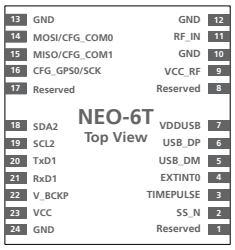
Serial interfaces	1 UART 1 USB V2.0 full speed 12 Mbit/s 1 DDC (I²C compliant) 1 SPI (NEO-6T only)	
Digital I/O	2 configurable timepulse (1 for NEO-6T) 1 EXTINT input for Timemark 1 reset (LEA-6T only)	
Serial and I/O voltages	2.7 V – 3.6 V	
Timepulse	Configurable	0.25 Hz to 10 MHz
Protocols	NMEA, UBX binary, RTCM	

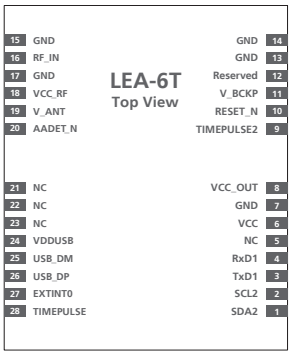
Package

LEA-6T: 28 pin LCC (Leadless Chip Carrier):
17.0 x 22.4 x 2.4 mm, 2.1 g

NEO-6T: 24 pin LCC (Leadless Chip Carrier):
12.2 x 16.0 x 2.4 mm, 1.6 g

Pinout





Environmental data, quality & reliability

Operating temp.	–40° C to 85° C
Storage temp.	–40° C to 85° C

RoHS compliant (lead-free)

Qualification according to ISO 16750

Manufactured in ISO/TS 16949 certified production sites

Support products

u-blox 6 Evaluation Kits:

Easy-to-use kits to get familiar with u-blox 6 positioning technology, evaluate functionality, and visualize GPS performance.

EVK-6T	u-blox 6 Evaluation Kit with Precision Timing

Ordering information

LEA-6T-0	u-blox 6 GPS Module, Precision Timing, TCXO, 17 x 22.4 mm, 250 pcs/reel
LEA-6T-1	u-blox 6 GPS module, Precision Timing, TCXO, Flash, 17x22.4 mm 250pcs/reel
NEO-6T-0	u-blox 6 GPS module, Precision Timing, TCXO, 12.2x16 mm, 250 pcs/reel

Available as samples and tape on reel

Contact us

HQ Switzerland / EMEA
+41 44 722 7444
info@u-blox.com

Americas
+1 703 483 3180
info_us@u-blox.com

APAC – Singapore
+65 6734 3811
info_ap@u-blox.com

China
+86 10 68 133 545
info_cn@u-blox.com

India
+91 959 1302 450
info_in@u-blox.com

Japan
+81 3 5775 3850
info_jp@u-blox.com

Korea
+82 2 542 0861
info_kr@u-blox.com

Taiwan
+886 2 2657 1090
info_tw@u-blox.com