

LEA-6T / NEO-6T

u-blox 6 Precision Timing GPS modules

Highlights

- Precision Timing:
 - 1 or 2 timepulse outputs (up to 10 MHz)
 - Output timepulse with at least one satellite in view
 - Stationary mode for GPS timing operation
 - Time mark of external event inputs
- Raw data
- 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 Firmware update
- 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 provide precision GPS timing for demanding positioning applications such as basestations. This module features user configurable frequency output and timepulse. 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 output 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. Raw data is also provided.

LEA-6T/NEO-6T modules are manufactured in ISO/TS 16949 certified sites. Each module is tested and inspected during production. The modules are qualified according to ISO 16750 - Environmental conditions and electrical testing for electrical and electronic equipment for road vehicles.

Product selector

Model	Type	Supply	Interfaces	Features
	Standalone GPS Standalone GLONASS Timing & Raw Data Dead Reckoning	1.75 V - 2.0 V 2.7 V - 3.6 V	UART USB SPI DDC (I ² C compliant)	Programmable (Flash) FW update Oscillator RTC crystal Antenna supply and supervisor Configuration pins Timepulse External interrupt / Wakeup
LEA-6T-0	•	•	• • • •	F T • • 2 •
LEA-6T-1	•	•	• • • •	• T • • 2 •
NEO-6T-0	•	•	• • • •	T • ○ 3 1 •

F = Serial Flash memory available on LEA-6T-0 for storage of configuration
○ = requires external components and integration on application processor

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 ¹	Position	2.5 m CEP
	SBAS	2.0 m CEP
Acquisition ¹	Cold starts:	26 s
	Aided starts ² :	1 s
	Hot starts:	1 s
Sensitivity ³	Tracking:	-162 dBm
	Cold starts:	-148 dBm
	Hot starts:	-157 dBm

¹ All SV @ -130 dBm

² Dependent on aiding data connection speed and latency

³ Demonstrated with a good active antenna

Timing performance data

Timing accuracy	RMS	30 ns
	99%	< 60 ns
	Granularity	21 ns
	Compensated	15 ns ⁴

⁴ Quantization error information can be used to compensate the granularity related error of the timepulse signal

Electrical data

Power supply	2.7-3.6V
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 (I ² C 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

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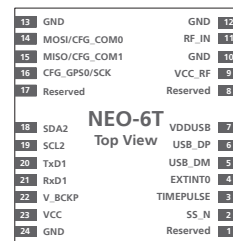
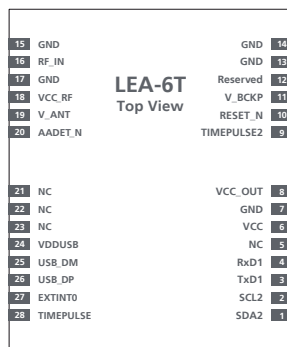
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Specification applies to FW 7

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 22mm, 250 pcs/reel
LEA-6T-1	u-blox 6 GPS module, Precision Timing, TCXO, Flash, 17x22mm 250pcs/reel
NEO-6T-0	u-blox 6 GPS module, Precision Timing, TCXO, 12x16mm, 250 pcs/reel

Available as samples and tape on reel

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