LEA-6 module series
u-blox 6 GPS receivers

Highlights

- Industry standard 22.4 x 17 x 2.4 mm package
- UART, USB and DDC (I²C compliant) interfaces
- Supports crystal for cost effectiveness or TCXO for exceptional Kickstart performance
- Onboard RTC Crystal for warm and hot starts
- Antenna supervisor

LEA-6

Features

- u-blox 6 position engine:
    - Navigate down to -160 dBm and -147 dBm coldstart
    - Configurable power management
    - Hybrid GPS/SBAS engine (WAAS, EGNOS, MSAS, GAGAN)
    - Up to 5 Hz navigation rate
    - Anti-jamming technology
- A-GPS: AssistNow Online and AssistNow Offline services, OMA SUPL compliant
- GALILEO ready (LEA-6H)
- Backward compatible (hardware and firmware); easy migration from LEA-5 or LEA-4 families
- Based on AEC-Q100 qualified chips
- Manufactured in ISO/TS 16949 certified sites
- LCC package for reliable and cost effective manufacturing
- Operating temperature range: -40 to 85°C
- Microsoft® certified USB driver

Product description

The LEA-6 module series brings the high performance of the u-blox 6 position engine to the industry standard LEA form factor. u-blox 6 has been designed with low power consumption and low costs in mind. Intelligent power management is a breakthrough for low-power applications. These versatile, standalone receivers combine an extensive array of features with flexible connectivity options. Their ease of integration results in fast time-to-market for a wide range of automotive, consumer and industrial applications. All LEA-6 modules are based on AEC-Q100 qualified chips and are manufactured in ISO/TS 16949 certified sites.

Product selector

Model	Type				Supply		Interfaces				Features						
	Standalone GPS	Capture & Process	Timing & Raw Data	Dead Reckoning	1.75 - 2.0 V	2.7 - 3.6 V	UART	USB	SPI	DDC (I²C compliant)	Programmable (Flash) FW update	TCXO (KickStart)	RTC Crystal	Antenna supply and supervisor	Configuration pins	Timepulse	External interrupt / Wakeup
LEA-6H	•					•	•	•	•	•	•	•	•	•		1	•
LEA-6S	•					•	•	•	•	•		•	•	•	1	1	•
LEA-6A	•					•	•	•	•	•			•	•	1	1	•

Receiver performance data

Receiver type	50-channel u-blox 6 engine GPS L1 C/A code GALILEO L1 open service (with upgrade) SBAS: WAAS, EGNOS, MSAS, GAGAN	
Navigation update rate	up to 5 Hz (ROM version), 2 Hz (Flash)	
Accuracy[1]	Position	2.5 m CEP
	SBAS	2.0 m CEP

Acquisition[1]		LEA-6H/6S	LEA-6A
	Cold starts:	28 s	32 s
	Aided starts[2]:	1 s	< 3 s
	Hot starts:	1 s	1 s

Sensitivity[3]		LEA-6H/6S	LEA-6A
	Tracking:	−160 dBm	−160 dBm
	Reacquisition:	−160 dBm	−160 dBm
	Cold starts:	−147 dBm	−146 dBm
	Hot starts:	−156 dBm	−155 dBm

Operational limits	Velocity: 500 m/s Altitude: 50,000 m

[1] All SV @ −130 dBm
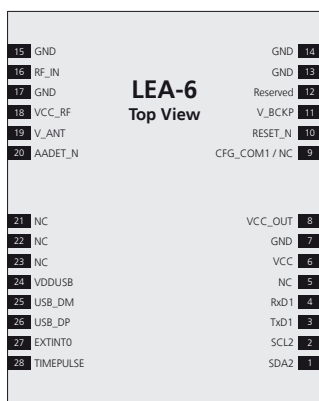[2] Dependent on aiding data connection speed and latency
[3] Demonstrated with a good active antenna

Electrical data

Power supply	2.7-3.6 V
Power consumption	115 mW @ 3.0 V (Max Performance) 51 mW @ 3.0 V (Power Save mode @ 1 Hz)
Backup power	1.4-3.6 V, 25 µA
Antenna power	External or internal VCC_RF
Supported Antennas	Active and passive
Antenna supervision	Integrated short-circuit detection and antenna shutdown, open circuit detection with minimal external circuitry

Package

Dimensions	LCC (Leadless Chip Carrier), surface mount package: 22.4 x 17 x 2.4 mm
Weight	2.1 g
Pinout	

```
15  GND                          GND   14
16  RF_IN                        GND   13
17  GND            LEA-6     Reserved  12
18  VCC_RF        Top View     V_BCKP  11
19  V_ANT                      RESET_N 10
20  AADET_N              CFG_COM1 / NC  9

21  NC                       VCC_OUT   8
22  NC                          GND    7
23  NC                          VCC    6
24  VDDUSB                      NC     5
25  USB_DM                      RxD1   4
26  USB_DP                      TxD1   3
27  EXTINT0                     SCL2   2
28  TIMEPULSE                   SDA2   1
```

Interfaces

Serial interfaces	1 UART 1 USB V2.0 full speed 12 Mbit/s 1 DDC (I²C compliant)	
Digital I/O	Configurable timepulse 1 EXTINT input for Wakeup 1 reset	
Serial and I/O	Voltages	2.7-3.6 V
Timepulse	Configurable	0.1 Hz to 10 kHz
Protocols	NMEA, UBX binary	

Environmental data

Operating temp.	−40° C to 85° C
Storage temp.	−40° C to 85° C
Humidity	JEDEC MSL 4
RoHS compliant (lead-free)	

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-6H:	u-blox 6 Evaluation Kit with TCXO, suitable for LEA-6H, LEA-6S
EVK-6P:	u-blox 6 Evaluation Kit with crystal, suitable for LEA-6A

Ordering information

LEA-6H-0	**Programmable** u-blox 6 GPS Module with TCXO
LEA-6S-0	ROM-based u-blox 6 GPS Module with TCXO
LEA-6A-0	ROM-based u-blox 6 GPS Module with Crystal

Available as samples and tape on reel (250 pieces)

Contact us

HQ Switzerland +41 44 722 7444 info@u-blox.com	China +86 10 68 133 545 info_cn@u-blox.com
EMEA +41 44 722 7444 info@u-blox.com	Japan +81 3 5775 3850 info_jp@u-blox.com
Americas +1 703 483 3180 info_us@u-blox.com	Korea +82 02 542 0861 info_kr@u-blox.com
APAC – Singapore +65 6734 3811 info_ap@u-blox.com	Taiwan +886 2 2657 1090 info_tw@u-blox.com