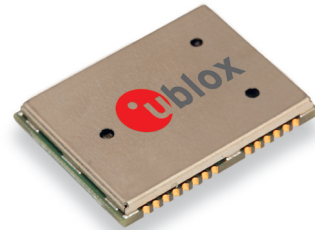


LEA-6 series

u-blox 6 GPS, QZSS, GLONASS and Galileo modules

Highlights

- Multi-constellation variants:
 - GPS (LEA-6A/S)
 - GPS, Galileo ready (LEA-6H)
 - GPS/QZSS, GLONASS (LEA-6N)
- Optimized mode for low power and maximum sensitivity
- UART, USB and DDC (I²C compliant) interfaces
- Integrated antenna supervisor



LEA-6:
17.0 x 22.4 x 2.4 mm

Features

- u-blox 6 position engine:
 - Navigate down to -162 dBm and -148 dBm coldstart
 - Faster acquisition with AssistNow Autonomous
 - Configurable power management
 - 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-5 or LEA-4 families
- LCC package for reliable and cost effective manufacturing
- Compatible with u-blox GPS Solution for Android
- Based on GNSS chips qualified according to AEC-Q100
- Manufactured in ISO/TS 16949 certified production sites
- Qualified according to ISO 16750

Product description

LEA-6 modules bring the high performance u-blox 6 position engine to the industry standard LEA form factor. u-blox 6 has been designed for low power consumption and low costs, independent of which satellite constellation is used (e.g. GLONASS, Galileo). Intelligent power management is a breakthrough for low-power applications. The versatile, standalone LEA-6 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 and industrial applications.

LEA-6 modules work with all available satellite positioning systems: LEA-6H is ready to support the European Galileo system via a simple firmware upgrade; LEA-6N combines full feature GPS performance with the QZSS regional satellite system. LEA-6N also targets the Russian market, featuring the lowest power GLONASS functionality in the industry and is designed for ERA-GLONASS.

All LEA-6 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	Standalone Galileo	QZSS	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-6N	•	•	R	•			•		•	•		•	T	O	•		1		•
LEA-6H	•		R				•		•	•		•	T	O	•		1		•
LEA-6S	•						•		•	•		•	T	O	•		1	1	•
LEA-6A	•						•		•	•		•	C	O	•		1	1	•

R = HW ready, firmware upgrade required.
O = Onboard RTC crystal for faster warm and hot starts.

C = Crystal / T = TCXO

Receiver performance data

Receiver type	50-channel u-blox 6 engine GPS/QZSS L1 C/A code GLONASS L1 FDMA Galileo L1 open service (with upgrade) SBAS: WAAS, EGNOS, MSAS		
Navigation update rate	up to 5 Hz (ROM version), 2 Hz (Flash)		
Accuracy ¹	GPS	GLONASS	
Position	LEA-6H/6S/6N/6A	LEA-6A	LEA-6N
SBAS	2.5 m CEP	4 m CEP	n.a.
Acquisition ¹	LEA-6H/6S/6N	LEA-6A	LEA-6N
Cold starts:	26 s	27 s	38 s
Aided starts ² :	1 s	3 s.	n.a.
Hot starts:	1 s	1 s	3 s
Sensitivity ³	LEA-6H/6S/6N	LEA-6A	LEA-6N
Tracking:	-162 dBm	-162 dBm	-158 dBm
Cold starts:	-148 dBm	-147 dBm	-138 dBm
Hot starts:	-157 dBm	-156 dBm	-153 dBm

¹ All SV @ -130 dBm

² Demonstrated with a good active antenna

³ Dependent on aiding data connection speed and latency

Electrical data

Power supply	2.7 V – 3.6 V		
Power consumption	GPS	GLONASS	
Continuous ⁴	LEA-6H/6S/6N	LEA-6A	LEA-6N
Power Save Mode ^{4,5}	36 mW	33 mW	n.a.
Backup power	1.4 V – 3.6 V, 22 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		

⁴ @ 3.0 V.

⁵ PSM @ 1 Hz.

Interfaces

Serial interfaces	1 UART 1 USB V2.0 full speed 12 Mbit/s 1 DDC (I ² C compliant)	
Digital I/O	Configurable timepulse 1 EXTINT input for Wakeup 1 reset	
Serial and I/O	Voltages	2.7 V – 3.6 V
Timepulse	Configurable	0.25 Hz to 1 kHz
Protocols	NMEA, UBX binary, RTCM	

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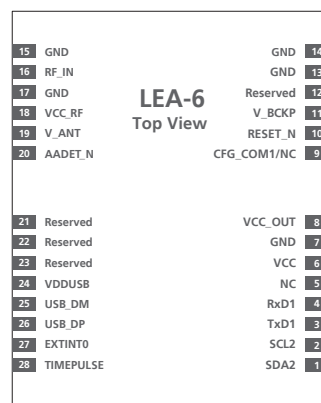
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Specification applies to FW 7 and GLONASS FW 1.00
LEA-6N values: Objective Specification

Package

28 pin LCC (Leadless Chip Carrier): 17.0 x 22.4 x 2.4 mm, 2.1 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:

EVK-6N:	u-blox 6 Evaluation Kit GPS/GLONASS/QZSS with TCXO, suitable for LEA-6N
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-6N-0	u-blox 6 GPS/GLONASS/QZSS Module, TCXO, Flash, 17 x 22mm, 250 pcs/reel
LEA-6H-0	u-blox 6 GPS Module, TCXO, Flash, 17 x 22mm, 250 pcs/reel
LEA-6S-0	u-blox 6 GPS Module, TCXO, 17x22mm, 250 pcs/reel
LEA-6A-0	u-blox 6 GPS Module, 17x22mm, 250 pcs/reel

Available as samples and tape on reel (250 pieces)

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