

# LEA-5 module series

## u-blox 5 GPS and GALILEO receivers

### Product description

The LEA-5 module series brings the high performance of the u-blox5 positioning engine to the industry standard LEA form factor. These versatile, stand-alone receivers combine an extensive array of features with flexible connectivity options. Their ease of integration results in fast times-to-market for a wide range of automotive, consumer and industrial applications with strict size and cost requirements.



22.4 x 17 x 3 mm

### Highlights

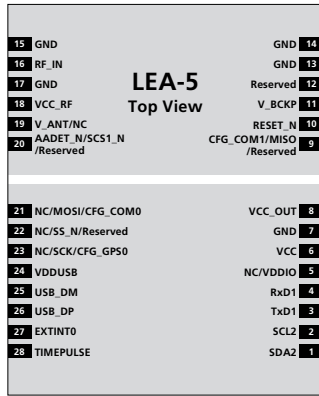
- 50-channel u-blox5 engine with over 1 million effective correlators
- < 1 second Time-To-First-Fix for hot and aided starts
- -160 dBm SuperSense® sensitivity
- Accelerated startup at weak signals with KickStart feature
- Up to 3 serial interfaces: 1 UART, 1 USB, 1 DDC (I<sup>2</sup>C compliant). 1 SPI planned.
- Supports AssistNow Online and AssistNow Offline A-GPS services; OMA SUPL compliant
- High immunity to jamming
- Hybrid GPS, GALILEO and SBAS (WAAS, EGNOS, MSAS, GAGAN) engine
- Up to 4 Hz position update rate
- GALILEO-ready (LEA-5H)

### Features

Series	Power	Size	Memory	Function					Antenna		Input / Output					
	Voltage range [V]	Thickness [mm]	Programmable (Flash) FW update	Power save mode	KickStart	Dead Reckoning	Raw data	Precision Timing	Antenna supply	Antenna supervisor	UART	USB	SPI	DDC (I <sup>2</sup> C compliant)	Reset input	Configuration pin
LEA-5H	2.7 - 3.6	3	•	•	•				•	•	1	1		1	•	
LEA-5S	2.7 - 3.6	3		P	•				•	•	1	1		1	•	1
LEA-5A	2.7 - 3.6	3		P					•	•	1	1		1	•	1
LEA-5Q	2.7 - 3.6	2.4		P	•						1	1	P	1	•	3
LEA-5M	2.7 - 3.6	2.4		P							1	1		1	•	2

P = Planned

## Mechanical data



Dimensions  
22.4 x 17 x 3 mm

Weight  
2.1 g

## Electrical data

Power supply	2.7 to 3.6V
Power consumption <sup>1</sup>	69 mW @ 3.0V Power Save mode 129 mW @ 3.0V Eco mode 135 mW @ 3.0V Max. Performance mode
Backup power	1.4 V to 3.6 V, 25µA
Antenna power	External or internal VCC_RF
Antenna supervision	Integrated short-circuit detection and antenna shutdown, open circuit detection is supported with AADET_N input and little external circuitry

## Support products

EVK-5H	u-blox 5 Evaluation Kit with KickStart suitable for: LEA-5H, LEA-5S, LEA-5Q
EVK-5P:	u-blox 5 Evaluation Kit with SuperSense <sup>®</sup> suitable for: LEA-5A, LEA-5M

## Ordering information

LEA-5H-0	Progr. u-blox 5 GPS Module with KickStart
LEA-5S-0	ROM-based u-blox 5 GPS Module with KickStart
LEA-5A-0	u-blox 5 ROM-based GPS Module
LEA-5Q-0	ROM-based u-blox 5 GPS Module with KickStart
LEA-5M-0	ROM-based u-blox 5 GPS module

Available as samples and tape on reel (250 pieces)

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## Interfaces

Serial interfaces	1 UART 1 USBV2.0 full speed 12 Mbit/s 1 DDC (I <sup>2</sup> C compliant) 1 SPI (planned)
Digital I/O	Configurable time pulse 1 EXTINT input 1 Reset 1 config. pin (LEA-5A, LEA-5S)
Serial and I/O voltages	2.7 to 3.6V
Protocols	NMEA, UBX binary

## Receiver performance data

Receiver type	50-channel u-blox 5 engine GPS L1 C/A code GALILEO L1 open service (with upgrade) SBAS: WAAS, EGNOS, MSAS, GAGAN	
Max. update rate	4 Hz (ROM version), 2 Hz (Flash version)	
Accuracy <sup>1</sup>	Position	2.5 m CEP
	SBAS	2.0 m CEP
Acquisition <sup>1</sup>	LEA-5H/5S/5Q	LEA-5A/5M
	Cold starts:	29 s      32 s
	Warm starts:	29 s      32 s
	Aided starts <sup>2</sup> :	< 1 s      < 1 s
	Hot starts:	< 1 s      < 3 s
Sensitivity <sup>3</sup>	LEA-5H/5S/5Q	LEA-5A/5M
	Tracking:	-160 dBm      -160 dBm
	Reacquisition:	-160 dBm      -160 dBm
	Cold starts:	-144 dBm      -143 dBm
Timing accuracy	RMS	30 ns
	99%	< 60 ns
	Granularity	21 ns
Time pulse	Configurable	0.25 to 1000 Hz
A-GPS	Supports AssistNow Online and AssistNow Offline, OMA SUPL compliant	
Operational limits	Velocity:	500 m/s (972 knots)
	Altitude:	50,000 m
Operating temp.	-40° C to 85° C	
Storage temp.	-40° C to 85° C	

<sup>1</sup> All SV @ -130 dBm

<sup>2</sup> Dependent on aiding data connection speed and latency

<sup>3</sup> Demonstrated with a good active antenna

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