LEA-4 Module Series
ANTARIS®4 GPS Receivers

Overview

The LEA-4 module series consists of low power GPS receivers featuring the 16-channel ANTARIS 4 positioning engine. These reliable modules offer excellent navigation performance even in the most challenging environments and are suitable for a broad spectrum of GPS products whose key requirements include high performance, low power consumption and small size.

22.4 x 17.0mm

Highlights

- 16-channel ANTARIS 4 positioning engine
- Ultra low 34-39 mA power consumption
- 4 Hz position update rate
- USB and UART ports
- Power saving modes
- -158dBm SuperSense® Indoor GPS sensitivity[1]
- Supports AssistNow Online and AssistNow Offline[2] A-GPS services
- Supports SBAS: WAAS, EGNOS, MSAS
- Industry standard LEA form factor allows for easy migration

  [1] Available with selected models
  [2] A special firmware is required for AssistNow Offline

Features

	Power	Size	Memory	Function				Antenna		Input / Output				
	Voltage Range (V)	Thickness (mm)	Programmable (Flash) FW Update	SuperSense	Dead Reckoning	Raw Data	Precision Timing	Antenna Supply	Antenna Supervisor	UART	USB	SPI	Reset Input	Configuration Pin
LEA-4A								●	●	2	1		●	●
LEA-4H			●	●				●	●	1	1		●	
LEA-4M	2.7-3.3	3.0								2	1		●	●
LEA-4P			●					●	●	1	1		●	
LEA-4S				●				●	●	2	1		●	●

Mechanical Data

15	GND	GND	14
16	RF_IN	GND	13
17	GND	BOOT_INT	12
18	VCC_RF	V_BAT	11
19	V_ANT	RESET_N	10
20	AADET_N/(Reserved)	(Reserved)/GPSMODE6/PCS0_N	9
21	EXTINT1/GPSMODE5/FWD	VDD18OUT	8
22	NC/GPSMODE2/GPSMODE23/PCS2_N	GND	7
23	NC/GPSMODE7/SCK	VCC	6
24	VDDUSB	VDDIO	5
25	USB_DM	RxD1	4
26	USB_DP	TxD1	3
27	EXTINT0/SPEED	RxD2/(Reserved)/MISO	2
28	TIMEPULSE	TxD2/(Reserved)/MOSI	1

LEA-4 Top View

Dimensions   22.4 x 17.0 X 3mm

Weight   2.1 g

Receiver Performance Data

Receiver Type   16 channel, L1 frequency, C/A code

Max. Update Rate   4 Hz

Accuracy
Position	2.5 m CEP
DGPS / SBAS	2.0 m CEP [3]

Start-up Times[4]
Hot start	<3.5 sec
Warm start	33 sec
Cold start	34 sec
Aided start	5 sec
Reacquisition	< 1 s

Sensitivity
	LEA-4A/4M/4P	LEA-4H/4S
Cold starts	-140 dBm	-142 dBm
Acquisition	-140 dBm	-148 dBm
Tracking	-150 dBm	-158 dBm

Timing Accuracy
RMS	50 ns
99%	<100 ns

Operational Limits   Velocity   515 m/s (1000 knots)

[3] Depends on aiding data connection speed and latency

[4] Measured with good visibility and –125 dBm signal strength

Environmental Data

Operating Temp.
LEA-4M:	-30° to 70°C
LEA-4H/4P/4S/4A:	-40° to 85°C

Storage Temp.
LEA-4S/4H:	-40° to 85°C
LEA-4A/4M/4P:	-40° to 125°C

Vibration   5 Hz to 500 Hz, 5g (IEC 68-2-6)

Shock   Half sine 30g / 11ms (IEC 68-2-27)

Interfaces

USB   V1.1 (V2.0 compatible)

Serial Ports   1 UART

Digital I/O   Configurable time pulse
2 EXTINTs for receiver wake-up, optional A-GPS time synchronization

Serial and I/O Voltages   Configurable output levels between 1.65 and 3.6V
5V tolerant inputs

Protocols   NMEA, UBX binary, RTCM

Supports protocol mixing over same serial and USB ports

Electrical Data

Power Supply   2.7 to 3.3 V

Power Consumption

	typ.@3.0V	typ.@2.7V
LEA-4A:	35 mA	34 mA
LEA-4M:	35 mA	34 mA
LEA-4P:	36 mA	35 mA
LEA-4S:	38 mA	37 mA
LEA-4H:	39 mA	38 mA
Sleep mode	typ. 65 µA	

Backup Power   1.5 V to 3.6 V, typ. 5 µA

Antenna Power   External or Internal VCC_RF

Antenna Supervision[5]   Integrated short-circuit detection and antenna shutdown, open circuit detection is supported with AADET_N input and little external circuitry

Support Products

AEK-4P   ANTARIS® 4 GPS Evaluation Kit

AEK-4H   ANTARIS® 4 SuperSense® Evaluation Kit

Ordering Information

LEA-4M-0-000-0	LEA-4M – ANTARIS® 4 ROM-Based GPS Module
LEA-4A-0-000-0	LEA-4A – ANTARIS® 4 ROM-Based GPS Module
LEA-4S-0-000-0	LEA-4S – ANTARIS® 4 ROM-Based GPS Module
LEA-4H-0-000-0	LEA-4H – ANTARIS® 4 Programmable GPS Module
LEA-4P-0-000-0	LEA-4P – ANTARIS® 4 Programmable GPS Module

Delivery Packing
0 = single samples
1 = Tape on reel 100 pieces[5]
2 = Tape on reel 250 pieces[6]

[5] Not available with LEA-4M
[6] Not available with LEA-4H/4P