LEA-4T

ANTARIS®4 GPS module with Precision Timing

Product description

The LEA-4T supports precision GPS timing and raw measure-ment data for demanding positioning applications. It features a Time Mode function whereby the GPS receiver assumes a stationary 3D position, whether programmed manually or de-termined by an initial self-survey. Stationary operation enables GPS timing with only one visible satellite and eliminates timing errors which otherwise result from positioning errors. The accuracy of the time pulse is as good as 50 ns, synchronized to GPS or UTC time. An accuracy of 15 ns is achievable by using the quantization error information to compensate the granu-larity of the time pulse. The built-in 2-channel time mark and counter unit provides precise time measurement of external interrupt signals.

The LEA-4T also supports raw measurement data (carrier phase with half-cycle ambiguity resolved, code phase and Doppler measurements), which can be used in external applications that offer precision positioning, real-time kine-matics (RTK) and attitude sensing.
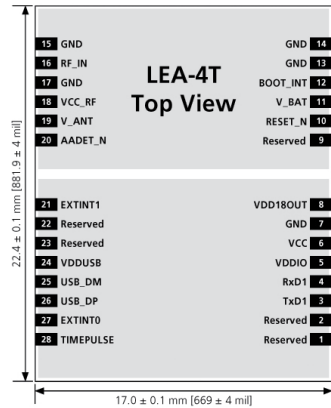
22.4 x 17.0 X 3 mm

Highlights

- 16-channel ANTARIS®4 positioning engine
- Stationary mode for GPS timing operation
- 15 ns timing accuracy (error compensated)
- Single Satellite GPS timing
- 10 Hz raw measurement data output

- Ultra low 39 mA power consumption
- –158 dBm SuperSense® indoor GPS sensitivity
- Supports AssistNow Online A-GPS service
- Supports SBAS: WAAS, EGNOS, MSAS

Features

Series	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-4T	2.7 - 3.6	3.0			●	●	●			1	1		●	

Mechanical data

LEA-4T
Top View

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 9
21 EXTINT1	VDD18OUT 8
22 Reserved	GND 7
23 Reserved	VCC 6
24 VDDUSB	VDDIO 5
25 USB_DM	RxD1 4
26 USB_DP	TxD1 3
27 EXTINT0	Reserved 2
28 TIMEPULSE	Reserved 1

22.4 ± 0.1 mm [881.9 ± 4 mil]

17.0 ± 0.1 mm [669 ± 4 mil]

Electrical data

Power supply	2.7 V to 3.3 V
Power consumption	typ. 39 mA @ 3.0 V 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	Integrated short-circuit detection and antenna shutdown, open circuit detection is supported with AADET_N input and little external circuitry

Support Products

AEK-4T: ANTARIS®4 GPS Timing Evaluation Kit	An easy-to-use kit to get familiar with the SuperSense® technology on ANTARIS®4 platforms and to evaluate functionality and to visualize GPS performance.

Environmental data

Operating Temp.	–40°C to 85°C
Storage Temp.	–40°C to 85°C
Vibration	5 Hz to 500 Hz, 5g (IEC 68-2-6)
Shock	Half sine 30g / 11ms (IEC 68-2-27)

Ordering information

LEA-4T-0-000-0	LEA-4T – ROM-Based GPS module with Precision Timing Delivery Packing 0 = Single samples 2 = Tape on reel (100 pieces)

Interfaces

USB	V1.1 (V2.0 compatible)
Serial ports	1 UART
Digital I/O	Configurable time pulse 2 EXTINT inputs for time mark / counter, receiver wake-up and A-GPS time synchronization
Serial and I/O voltages	Configurable output levels between 1.65 V and 3.6 V 5V tolerant inputs
Protocols	NMEA, UBX binary, RTCM Supports protocol mixing over same serial and USB ports

Receiver performance data

Receiver type	16 channel L1 frequency, C/A code	
Max. update rate	4 Hz	
Accuracy[1]	Position DGPS / SBAS	2.5 m CEP 2.0 m CEP
Start-up times[1]	Hot starts: Warm starts: Cold starts: Reacquisition:	< 3.5 s 33 s 34 s < 1 s
Sensitivity	Tracking: Acquisition & Reacquisition: Cold starts:	–158 dBm –148 dBm –142 dBm
Raw measurement data	Carrier phase Code phase Doppler measurements [Hz] Update rate:	[L1 cycles] [m] 10 Hz
Operational limits	Velocity:	515 m/s (1000 knots)

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

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