



LEADTEK GPS MODULE

LR9805ST Specification Sheet



- *SiRF StarII single chipset*
- *Compact module size for easy integration : 24 x 20 x 2.9 mm*
- *Multiple I/O pins reserved for customizing special user application:*
- *RoHS compliance*

Revision History:			
Revision	Release Date	Issuer	Change Description
0.9	2008/05/28	M. Huang	Add revision history; Modify operating temperature range and outlook dimension tolerance








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Introduction







The Leadtek LR9805ST GPS module is a high sensitivity, low power, Surface Mount Device (SMD). This 12-channel global positioning system (GPS) receiver is designed for a broad spectrum of OEM applications and is based on the fast and deep GPS signal search capabilities of SiRFstarII™ single chipset. As the single chip version of the LR9805T, The LR9805ST is pin-to-pin compatible with the LR9805-T for easier and faster transition.

The LR9805ST is designed to allow quick and easy integration into GPS-related applications such as:





-  PDA, Pocket PC, and other computing devices
-  Car and Marine Navigation
-  Fleet Management /Asset Tracking
-  AVL and Location-Based Services
-  Hand-Held Device for Personal Positioning and Navigation

Features

Hardware and Software

-  Based on the high performance features of the SiRFstarII single chipset
-  Compact module size for easy integration: 24x20x2.9 mm (0.94x0.79x0.11 in)
-  Fully automatic assembly: reflow solder assembly ready
-  Hardware compatible with SiRFXTrac software
-  Multiple I/O pins reserved for customizing special user applications
-  RoHS compliance

Performance

-  Cold/Warm/Hot Start Time: 45/38/4 sec at open sky and stationary environments
-  Reacquisition Time: 0.1 second
-  RF Metal Shield for best performance in noisy environments
-  Multi-path Mitigation Hardware

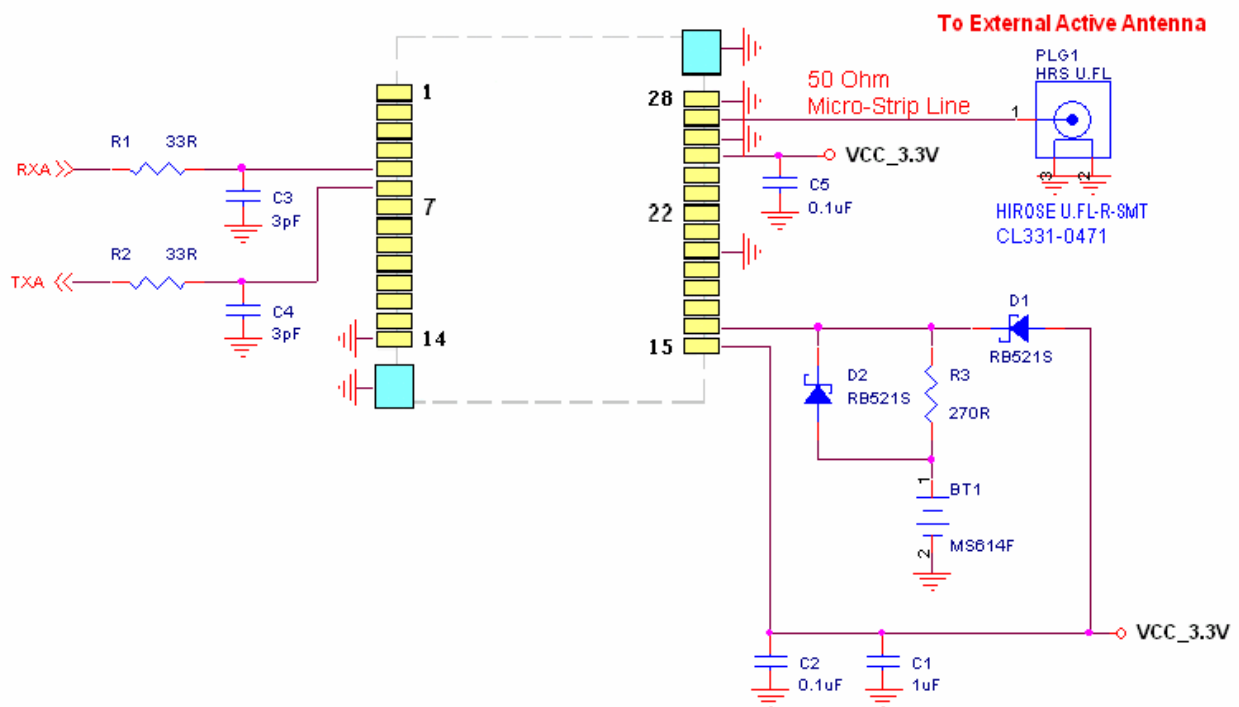
Interface

- TTL level serial port for GPS communications interface
- Protocol: NMEA-0183 / SiRF Binary (default NMEA)
- Baud Rate: 4800, 9600, 19200, 38400 or 57600 bps (default 4800)

Advantages

- Ideal for high volume mass production(Taping reel package)
- Cost saving through elimination of RF and board to board digital connectors
- Flexible and cost effective hardware design for different application needs
- Secure SMD PCB mounting method

Reference Design



- All ground pads attach directly to ground plane by way of via.
- All components are reference only.

Specifications

Technical Specifications

Feature	Item	Description
Chipset	GSC2x Series	SiRFstarII single chip technology
General	Frequency	L1, 1575.42 MHz
	C/A code	1.023 MHz chip rate
	Channels	12
Accuracy	Position	10 meters, 2D RMS
		5 meters 2D RMS, WAAS corrected <5meters(50%), DGPS corrected
	Velocity	0.1 meters/second
	Time	1 microsecond synchronized to GPS time
Datum	Default	WGS-84
	Other	selectable for other Datum
Time to First Fix (TTFF) (Open Sky and Stationary Environment)	Reacquisition	0.1 sec., average
	Hot start	4 sec., average typical TTFF
	Warm start	38 sec., average typical TTFF
	Cold start	45 sec., average typical TTFF
Dynamic Conditions	Altitude	18,000 meters (60,000 feet) max.
	Velocity	515 meters/second (1000 knots) max.
	Acceleration	4g, max.
	Jerk	20 meters/second ³ , max.
Power	Main power input	3.2 ~ 5.0 VDC input
	Power consumption	≈106 mW (continuous mode)
	Supply Current	≈32 mA
	Backup Power	1.65 ~ 5.0 VDC input.
Serial Port	Electrical interface	Two full duplex serial TTL interface.
	Protocol messages	NMEA-0183@4800 bps (Default)
Time-1PPS Pulse	Level	TTL
	Pulse duration	The 1PPS pulse width is 1 μs, this 1PPS is NOT suited to steer various oscillators (timing receivers, telecommunications system, etc).
	Time reference	At the pulse positive edge.
	Measurement	Aligned to GPS second, ±1 microsecond

Environmental Characteristics

Items	Description
Operating temperature range	-30 deg. C to +85 deg. C
Storage temperature range	-55 deg. C to +100 deg. C

Physical Characteristics

Items	Description
Length	24 mm (0.94in)
Width	20 mm (0.79 in)
Height	2.9 mm (0.11 in)
Weight	2.5g








Interface Specifications

Items	Description
I/O	28 pin SMD micro package

Software

The Leadtek LR9805ST module includes SiRFXTTrac high sensitivity software solution.

Features include:

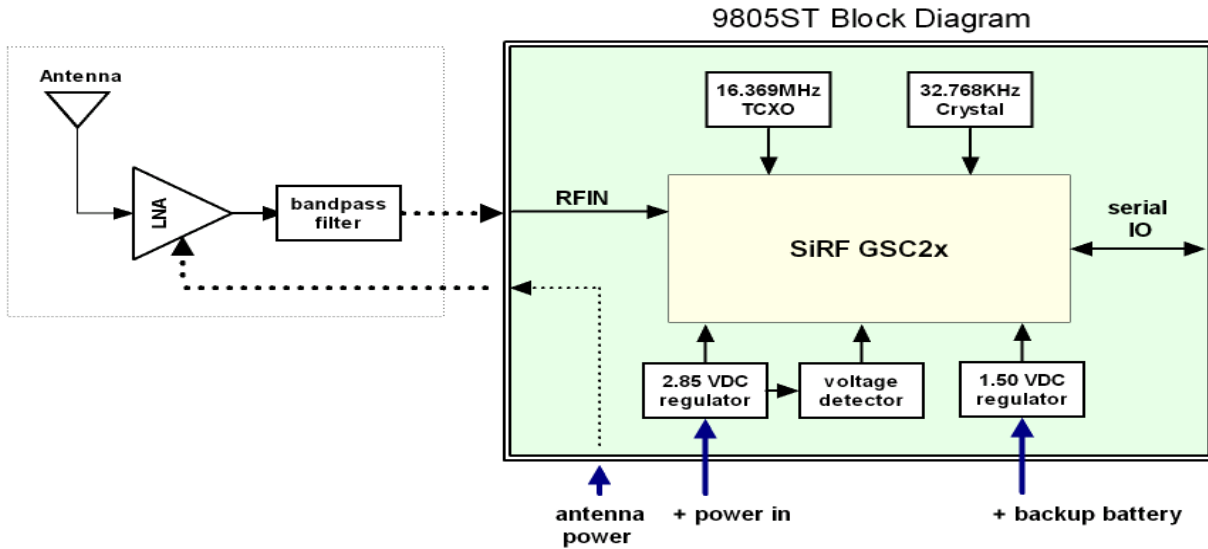
-  High tracking sensitivity (-154 dBm)
-  High configurability
-  1 Hz position update rate
-  Real-time Operating System (RTOS) friendly
-  Capable of outputting both NMEA and SiRF-proprietary binary protocols
-  Designed to accept custom user tasks executed on the integrated ARM7TDM1 processor
-  Runs in full power operation or optional power saving modes

SiRFXTTrac default configuration is as follows:

Item	Description
Core of firmware	SiRFXTTrac
Baud rate	4800, 9600, 19200, 38400 or 57600 bps (default 4800)
Code type	NMEA-0183 ASCII
Datum	WGS-84
Protocol message	GGA(1sec), GSA(5sec), GSV(5sec), RMC(1sec), VTG(1sec)
Output frequency	1 Hz

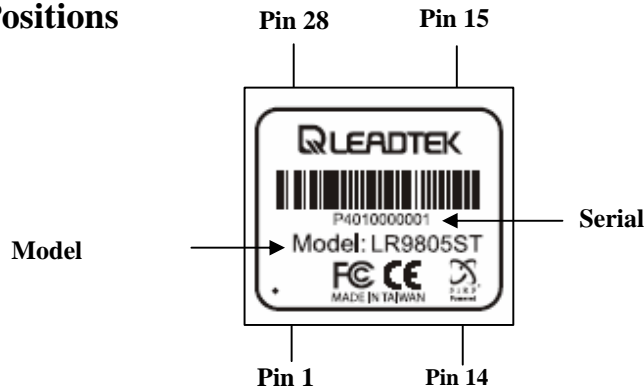
Electrical Specifications

Block Diagram



Interface Specification

Photos and Pin Positions



Pin Settings

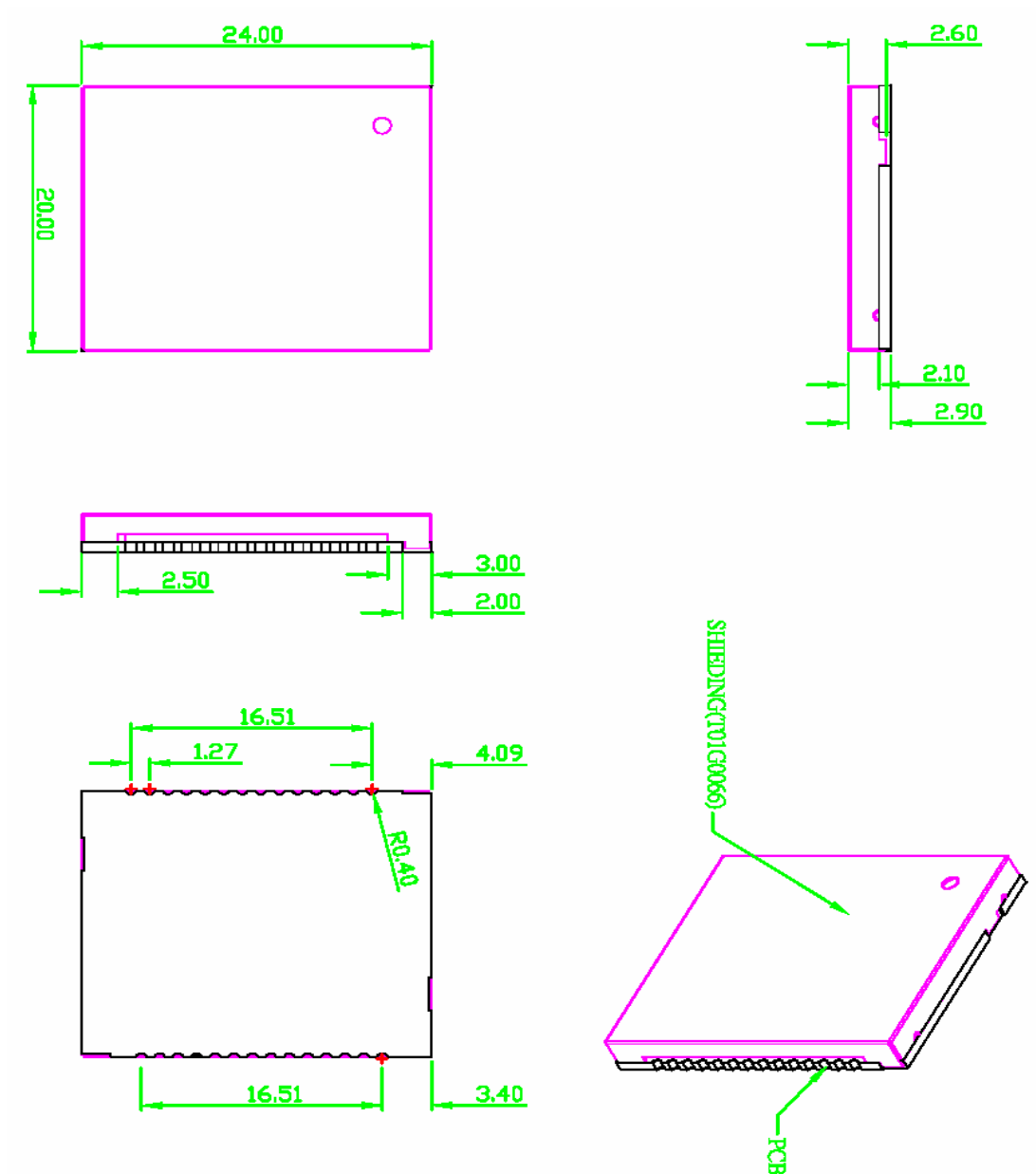
PIN	Name	Type	Description
1	REV	I	Reserved
2	GPIO6	I/O	Reserved
3	GPIO10	I/O	Reserved
4	RXDB	I	TTL UART Port B input. If not used, keep floating
5	RXDA	I	TTL UART Port A input
6	TXDA	O	TTL UART Port A output
7	GPIO5	I/O	Reserved
8	TIMEMARK	O	1 PPS timemark output
9	GPIO7	I/O	Reserved
10	GPIO11	I/O	Reserved
11	GPIO0	I/O	Reserved
12	GPIO1	I/O	Reserved
13	GPIO12	I/O	Reserved
14	GND	PWR	Ground
15	VCC_IN	PWR	3.2 ~ 5.0 VDC supply input
16	VSTBY	PWR	Apply 1.65 ~ 5.0 VDC for backup RTC & SRAM. If not used, keep floating
17	BOOTSEL1	I	Pull high for programming mode. If not used, keep floating
18	PBRESN	I	Reset pin, active low, If not used, keep floating
19	GPIO13	I/O	Reserved
20	GND	PWR	Ground
21	GPIO2	I/O	Reserved
22	GPIO3	I/O	Reserved
23	TXDB	O	TTL UART Port B output. If not used, keep floating
24	BOOTSEL0	I	Pull low for programming mode. If not used, keep floating
25	ANTPWR	PWR	Antenna power input
26	GND	PWR	Ground
27	RFIN	I	RF Signal input
28	GND	PWR	Ground

Mechanical Dimensions

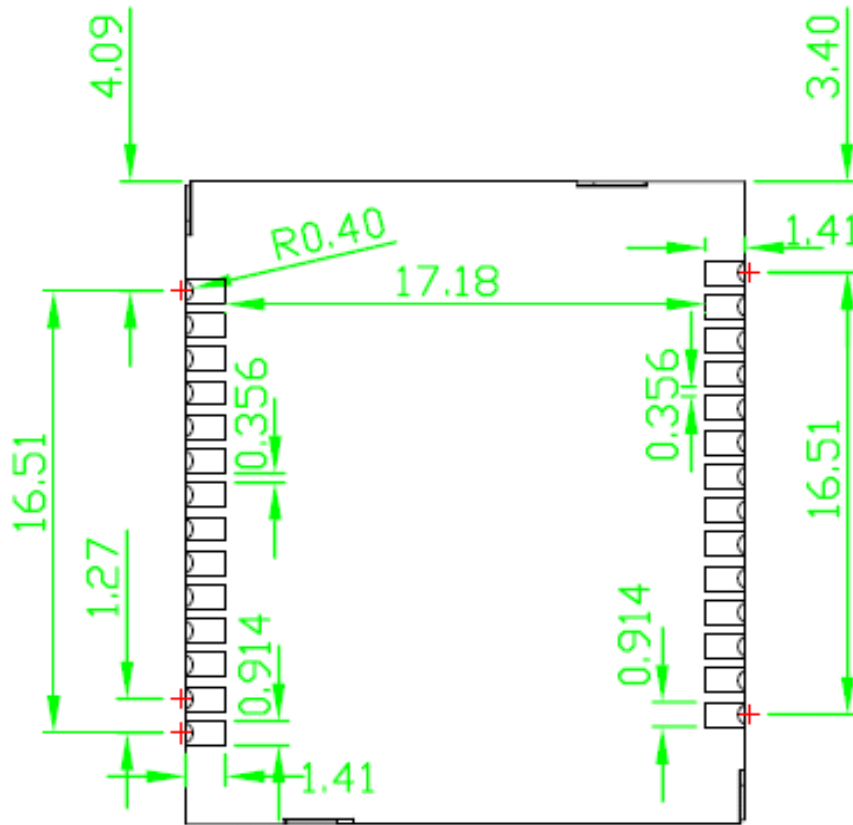
Outline Drawing (unit : mm)

Tolerance:

Length	24.0 ± 0.3 mm
Width	20.0 ± 0.3 mm
Height	2.90 ± 0.3 mm



Bottom view (unit : mm)



PCB PAD

Recommended Footprint (Unit : mm)

