Quectel Wireless Solutions

Wireless Module Expert

L50 GPS Module Presentation

April 2013

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New Features (L50 ROM2.2)

Item /Category	Brief Description
Hardware Baud Rate Configuration	Baud rate selection can be set upon startup through the pin21 (DR_I2C_DIO) and the pin22 (DR_I2C_CLK) configuration. Please note that if those two pins are unused, set baud rate as 4800bps by default.
SBAS Ranging	SBAS satellite ranging measurements are used in the navigation solution for improved DOP and coverage.
QZSS Support	The Quasi-Zenith Satellite System (QZSS) is supported in modules based on SiRFIV ROM2.2 version. The receiver can use available QZSS satellites for ranging, but only use one QZSS satellite at any given time.
5 Hz Navigation Update Rate	User selectable 1 Hz or 5 Hz Navigation computation and message output rate.
Fast Time-sync Mode	The Fast Time-sync Mode enables the receiver to determine time quickly from the GPS satellites and then stop receiving signals.

Product Advantages

SIRFstarIV™ Chip Solution

SBAS (WAAS, EGNOS and QZSS)
5 Hz Navigation Update Rate

Low Power Consumption

31mA@Tracking Mode
33mA @Acquisition Mode

Highest Sensitivity

-163dBm@Tracking Mode
-148dBm@Acquisition Mode

Fast Time-sync Mode

1 SV Fast Time Setting
3~9s @Cold Start

Embedded patch antenna

Default: 15.0x15.0x2.0mm

Hardware Baud Rate Configuration

Baud rate configured by hardware
Default: 4800 bps

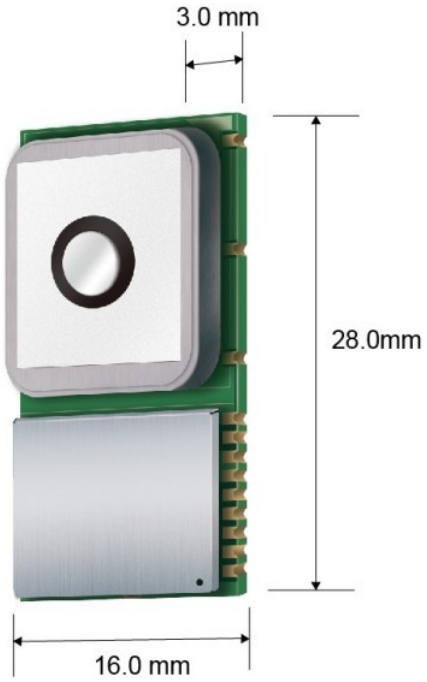
Active Jammer Remover

Removes in-band jammers up to 80 dB-Hz
Tracks up to 8 CW jammers

CGEE function

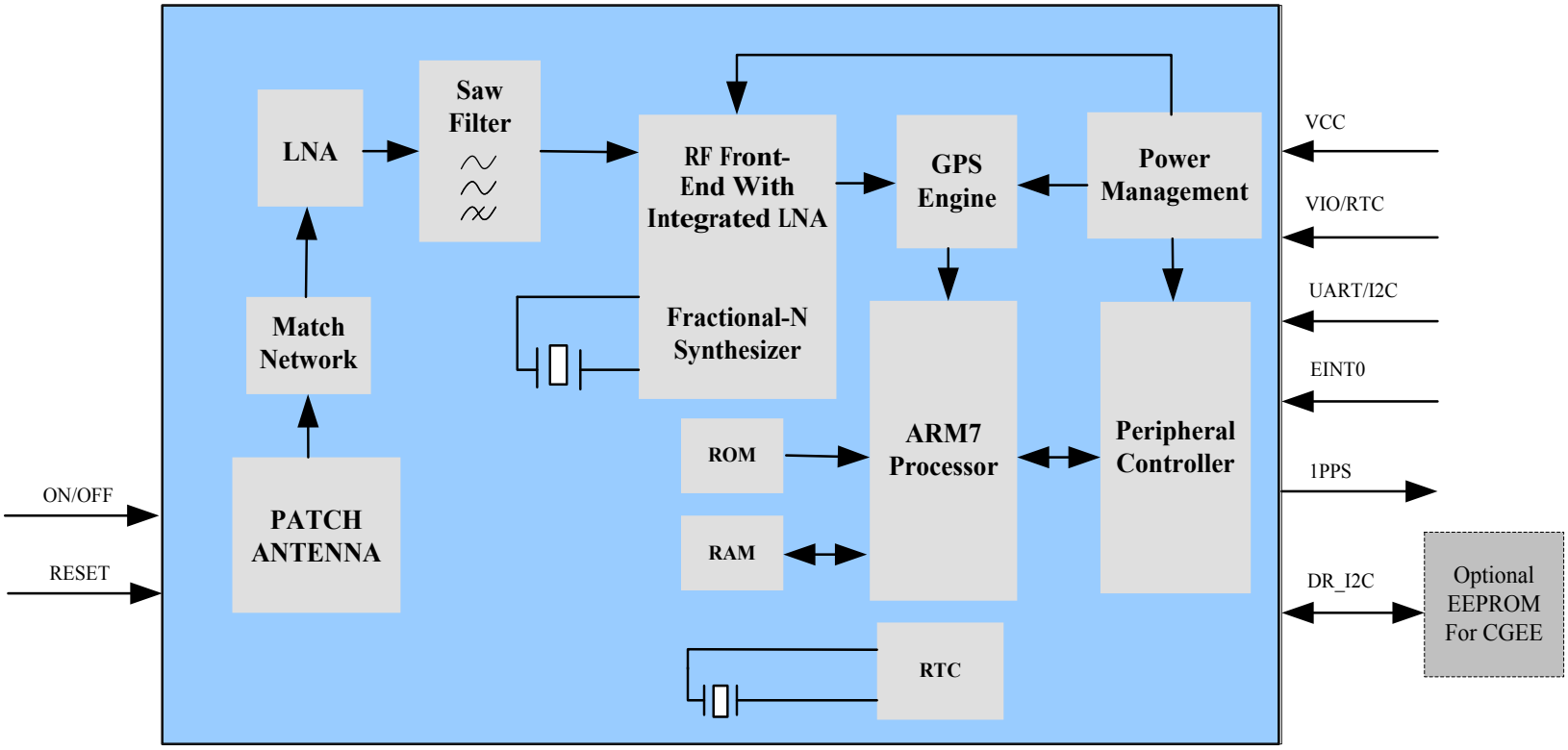
Up to 3-day ahead prediction

Mechanical Dimensions



Length:	28.0 mm
Width:	16.0 mm
Height:	3.0 mm
Weight:	4.0g

Hardware Architecture



Software Technology

- SiRFstarIV™ GSD4e ROM2.2 Firmware Version
  - The newest SiRF MP firmware with more functionalities
- Protocol
  - NMEA 0183 standard protocol V3.01 and backward compliance
  - SiRF OSP binary protocol
- Configurable Operating Modes
  - Configurable baud rates
  - Selectable navigation update rate
  - Readable firmware version
  - Selectable output massages

Target Applications

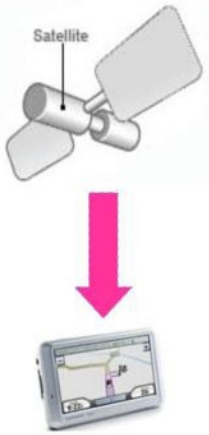
- Portable Devices
- Asset Tracking
- Connected PND
- GIS Application
- Security System
- Industrial PDA
- Vehicle Management

Performance differences

Item	L50 ROM2.2	L50 ROM1.3
Navigation Update Rate	1Hz (default), up to 5Hz	1Hz
Power Acquisition	33mA	48mA
Power Tracking	31mA	38mA
Hardware Baud Rate Configuration	Baud rate configured by hardware	Not supported
QZSS	Support	Not supported
SBAS Ranging	Support	Not supported
Fast Time-sync	GPS time synchronization will be finished about 3-9 seconds from a cold start-up.	GPS time synchronization will be finished about 15 seconds from a cold start-up.

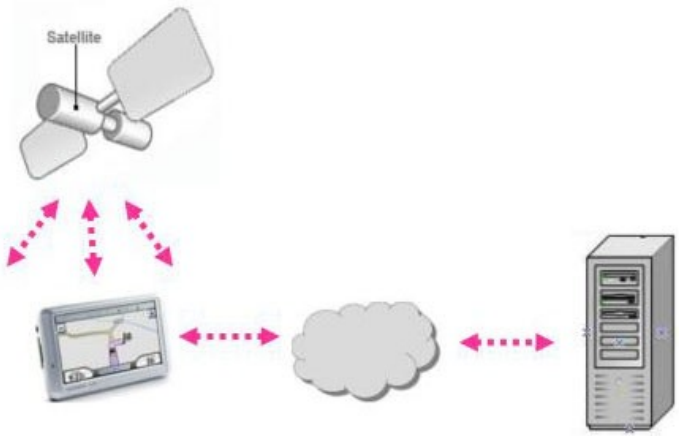
Self-Assisted CGEE (1)

- Shortcomings of Standalone GPS
  - Receiving ephemeris from satellites needs over 30 seconds.
  - In the condition of weak signals, it is more difficult to fix position.



- Shortcomings of Traditional online A-GPS

  (SUPL, uB*** - AssistNow online)
  - Require the wireless network coverage areas.
  - Consume time to establish a wireless connection and receive data.

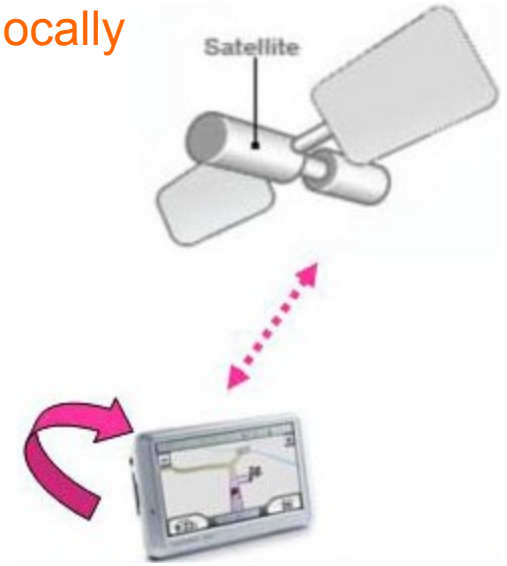


- Shortcomings of Traditional offline A-GPS

  (uB*** - AssistNow offline)
  - Periodic request of offline data. It is inconvenient for end-users.
  - Customers must provide downloading service for end-users.

Self-Assisted CGEE (2)

- Self-Assisted CGEE (Client Generated Extended Ephemeris)
  - Without the necessity of data download from server since it captures ephemeris data from satellites locally and predicts ephemeris out to 3 days.
  - An external EEPROM is used for data storage.
  - CGEE function is enabled automatically without any command input.
  - Achieve Warm Start with shorter TTFF while in weak GPS visibility conditions like urban environment.



RECEIVER PERFORMANCE (1)

Benefits from high-speed location engine and strict design:

- An embedded high efficient and high quality patch antenna
- High sensitivity navigation engine
- 48 track verification channels
- External LNA
- SAW filter design

L50 achieves:

- Enhanced receiver sensitivity and navigation performance
- Greater coverage
- The time to the first fix is reduced
- Improved positional accuracy

RECEIVER PERFORMANCE (2)

- Time To First Fix
- Sensitivity

Performance		L50
TTFF, autonomous, @-130dBm	Cold Start	<33s
	Warm Start	<33s
	Hot Start	<1s
TTFF with CGEE, @-130dBm	Warm Start	10s,typ.
	Hot Start	<1s
Sensitivity	Acquisition	-148dBm
	Tracking	-163dBm
	Reacquisition	-160dBm

Low-power design

Based on rigorous hardware design and adaptive micro-power controller, L50 features the lowest current consumption in acquisition, tracking and hibernate states.

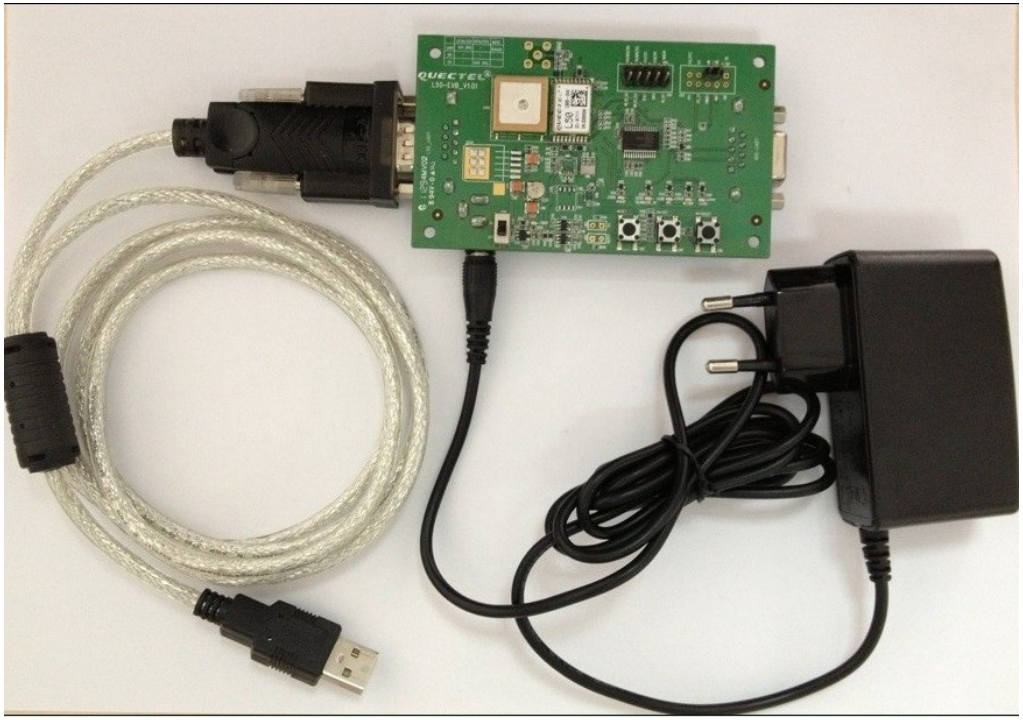
The following data is measured in the condition of open sky @ -130dBm.

State	Typical value
Acquisition	33mA
Tracking	31mA
Hibernate	14uA

Support Package(1)

Evaluating board

- **Interfaces**
  - GPS serial port
  - Antenna interface
  - Adapter interface
  - Test points
  - Power switch

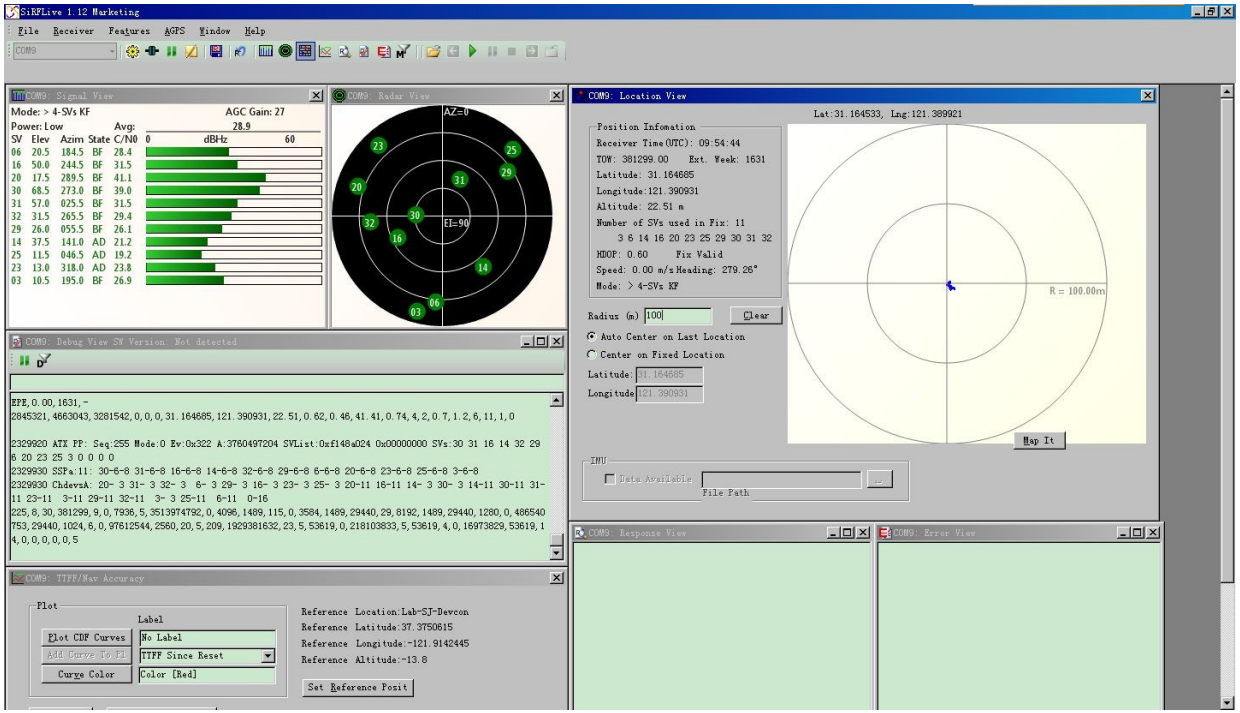


- **Accessories**
  - Serial port cable (USB 2.0 converter)
  - DC 5V/2A power adapter

Support Package(2)

- **Documents**
  - Hardware design
  - GPS protocol specification
  - Part&Decal in PADS and Protel format
  - AGPS (CGEE) application note
  - Evaluating board user guide

- **PC tool**
  - SiRFLive tool



THE END

Thank You!

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