Introduction to L26 GNSS Module

2013.05.13

Quectel Wireless Solutions Co., Ltd.
Room 501,Building 13,No.99 Tianzhou Road, Shanghai, China 200233
Tel：0086 21 51086236 Fax：0086 21 54453668

Contents

- General Description
  - Highlights
  - Mechanical Dimensions
  - Hardware Architecture
  - Firmware
  - Target Applications
- Features
  - Receiver Performance
  - Specifications
  - Self-AGPS EASY™ Technology
  - Periodic Standby Mode
  - AlwaysLocate™ Technology
  - L26 vs. Ucompany LEX-6N
- Support Package

Highlights

MT3333 Single Chip Multi-GNSS Solution

GPS / GLONASS / QZSS

Ultra Low Power Consumption

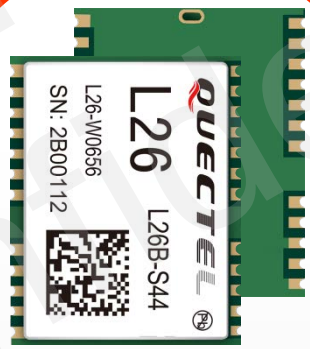
21mA@Tracking mode
29mA@Acquisition mode

AlwaysLocate™

An intelligent controller of power consumption

LOCUS

Innate logger solution with no need of host and external flash



Antenna Feature

Support short circuit protection and antenna detection

EASY™

Advanced AGPS technology without external memory

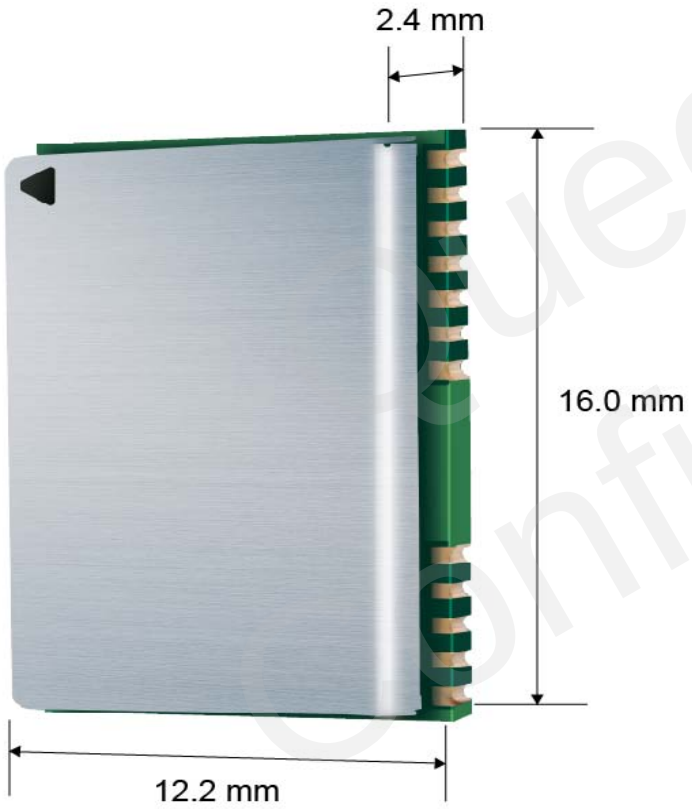
Anti-Jamming

Multi-tone Active Interference canceller

Highest Sensitivity

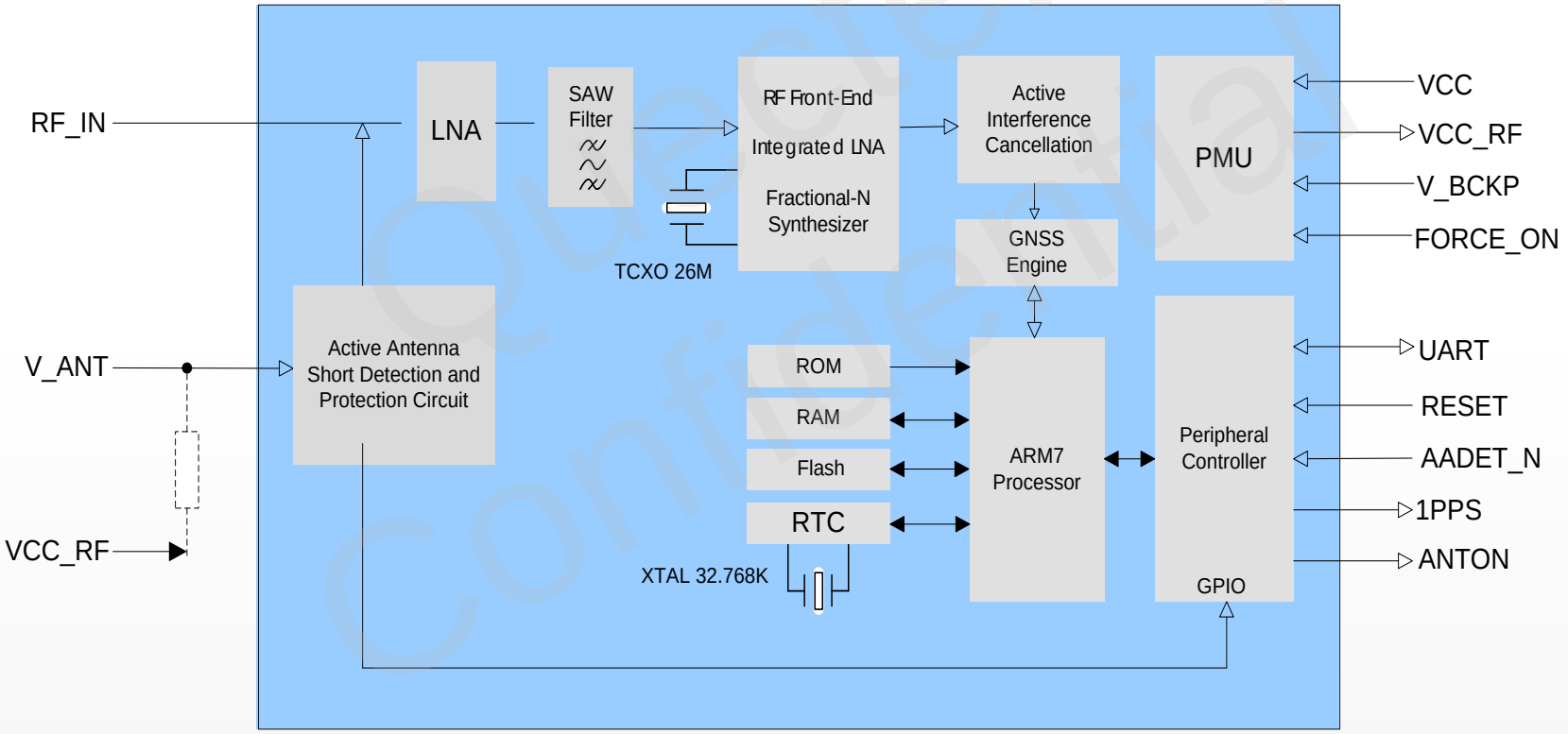
-165dBm@Tracking mode
-148dBm@Acquisition mode

Mechanical Dimensions



Length:	16.0 mm
Width:	12.2 mm
Height:	2.4 mm
Weight:	1.0 g

Hardware Architecture



Firmware

- Protocol
  - NMEA 0183 standard V3.01
  - MTK Private Protocol: PMTK
- Configurable Operating Modes
  - UART: Adjustable 4800~115200bps (default: 9600bps)
  - Update rate: 1Hz (default), up to10Hz
  - Selectable output NMEA messages
  - Configurable Periodic Standby Mode

Target Applications

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

Contents

- General description
  - Highlights
  - Mechanical Dimensions
  - Hardware Architecture
  - Firmware
  - Target Applications
- Features
  - Receiver Performance
  - Specifications
  - Self-AGPS EASY™ Technology
  - Periodic Standby Mode
  - AlwaysLocate™ Technology
  - L26 vs. Ucompany LEX-6N
- Support Package

Receiver Performance

- EASY™, advanced AGPS technology without the need of external memory
- Built-in LNA for better sensitivity
- Extremely low power consumption, 21mA @Tracking
- Support short circuit protection and antenna detection
- AlwaysLocate™, an intelligent algorithm for power saving
- LOCUS, innate logger solution with no need of host and external flash
- High sensitivity, -165dBm@Tracking, -148dBm@Acquisition
- Support DGPS, QZSS, SBAS(WASS/EGNOS/MSAS/GAGAN)
- Anti-Jamming, Multi-tone Active Interference Canceller

Specifications

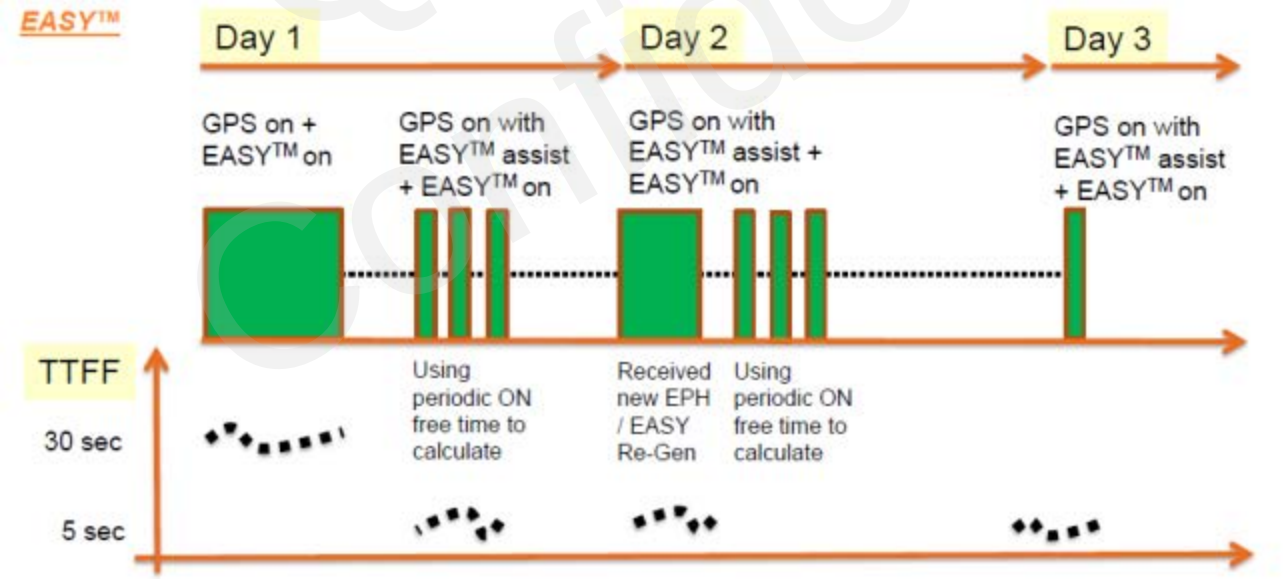
L1 Band Receiver (1575.42MHz)	Channel	33 (tracking) / 99 (acquisition)
	C/A code	
	SBA	WAAS, EGNOS MSAS,GAGAN
Horizontal Position Accuracy	Autonomous	<2.5m CEP
Velocity Accuracy	Without aid	<0.1m/s
Acceleration Accuracy	Without aid	0.1m/s²
Timing Accuracy	1PPS	10ns
Reacquisition Time		<1s
TTFF@-130dBm with EASY™	Cold Start	<15s
	Warm Start	<5s
	Hot Start	<1s
TTFF@-130dBm without EASY™	Cold Start	<35s
	Warm Start	<30s
	Hot Start	<1s
Sensitivity	Acquisition	-148dBm
	Tracking	-165dBm
	Re-acquisition	-160dBm

Environmental	Operating Temperature	-40℃ to 85℃
	Storage Temperature	-45℃ to 125℃
Dynamic Performance	Maximum Altitude	Max.18000m
	Maximum Velocity	Max.515m/s
	Maximum Acceleration	4G
Dimensions	16.0 x 12.2 x 2.4mm	
Weight	Approx. 1.0g	
Serial Interface	UART: Adjustable 4800~115200 bps Default: 9600bps	
Update Rate	1Hz by default, up to10Hz	
I/O Voltage	2.7V ~ 2.9V	
Protocols	NMEA 0183 PMTK	
Power Supply	2.8V ~ 4.3V	
Power Acquisition	29mA (GPS+GLONASS)	
Power Tracking	21mA (GPS+GLONASS)	
Power Saving	2.7mA@AlwaysLocate™	
	7uA@Backup Mode	
	350uA@Standby Mode	
	Periodic Mode	
Antenna Type	Active or Passive	
Antenna Power	External or Internal VCC_RF	

Self-AGPS EASY Technology(1)

- EASY™ is the abbreviation for Embedded Assist System for quick positioning. With EASY™ technology, the GNSS engine can calculate and predict automatically single ephemeris (up to 3 days)when the power is on, and then save the predict information into the memory. So the GNSS engine can use the information for positioning later if there are not enough information received from the satellites.

- This function will be helpful for positioning and TTFF improvement under indoor or urban conditions.



Self-AGPS EASY Technology(2)

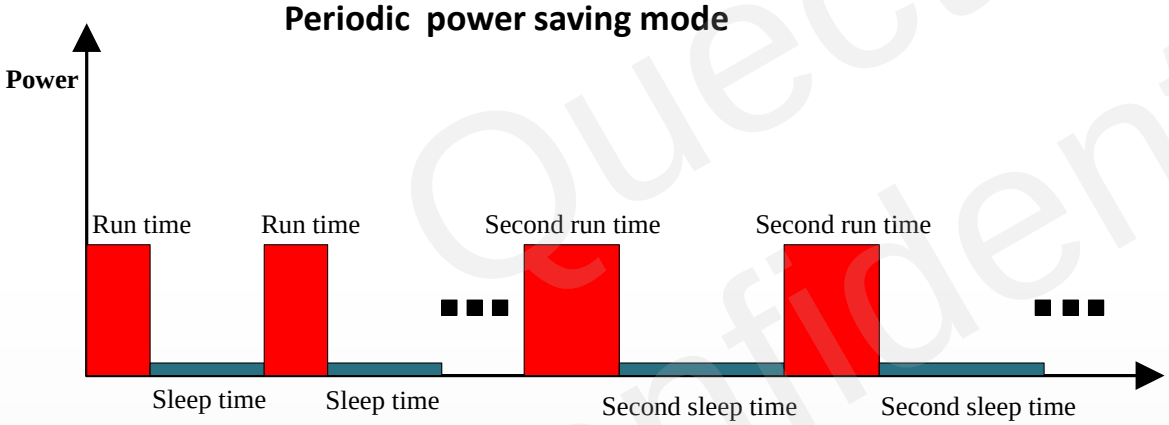
➢ **TTFF Comparison**

Test Condition		TTFF without EASY™	TTFF with EASY™
Under GNSS signal Generator, conductive power level -130dBm	Cold Start	<35s	<15s
	Warm Start	<30s	<5 s

With EASY™ technology, L26 accelerates TTFF obviously.

Periodic Standby Mode

Periodic standby mode can control power on/off time of GNSS periodically to reduce average power consumption, and on/off time can be configured by using PMTK command. For details, see the figure below.
Periodic standby mode can be entered by sending the following PMTK command.
$PMTK255, Type, Run time, Sleep time, Second run time, Second sleep time



Run time: tracking period (ms)
Sleep time: standby period (ms)
Second run time: extended acquisition period (ms) when GNSS acquisition fails during the Run time
Second sleep time: extended standby period (ms) when GNSS acquisition fails during the Run time

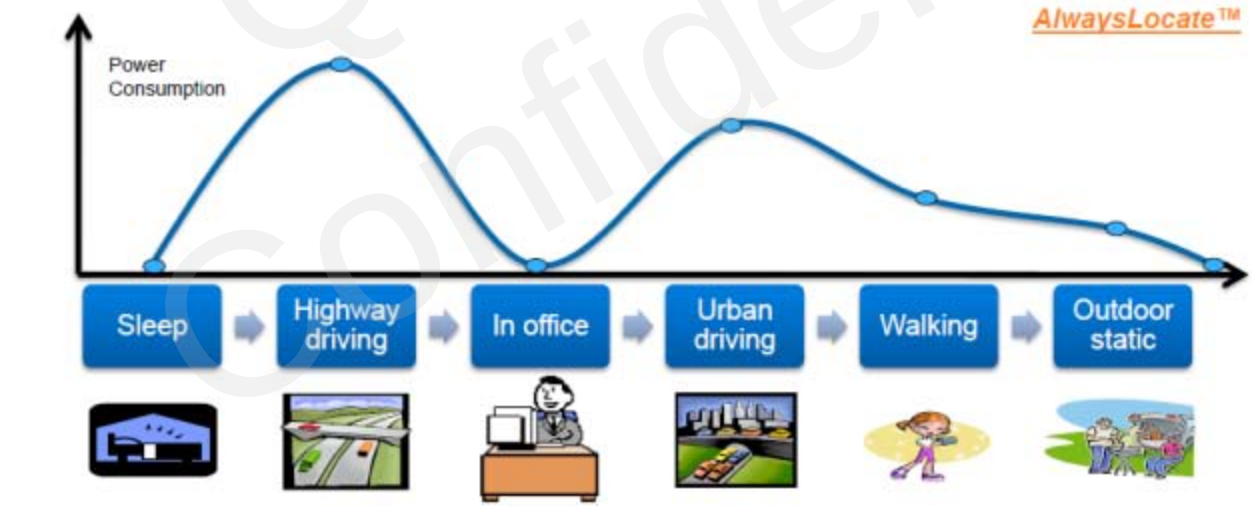
Notes:

1. Normally, the GNSS module will enter the periodic mode after successfully fixing position. But if acquisition fails, the GNSS module still can enter this mode.
2. If GNSS acquisition fails during the Run time, in order to ensure the success of reacquisition, it is better to set the longer Second run time.

Example: PMTK225, 1, 3000, 12000, 18000, 72000*16 for periodic mode with 3s in tracking mode and 12s sleep in standby mode. The average current is about 4.2mA.

AlwaysLocate™ Technology

- AlwaysLocate™ is an intelligent controller of periodic mode.
- L26 can adaptively adjust the on/off time to achieve balance between positioning accuracy and power consumption according to the environmental and motion conditions. So the average power consumption is lower in AlwaysLocate™ power saving mode than that in periodic power saving mode. Typical average power is 2.7mA.



L26 vs. Ucompany LEX-6N(1)

QUECTEL Wireless Module Expert

➢ Specification Comparison

Product Features		L26	Ucompany LEX-6N
Power supply		2.8V~4.3V	2.7V~3.6V
Power Consumption	Acquisition Mode	29mA@3.3V	40mA@3.0V typical
	Tracking Mode	21mA@3.3V	
Sensitivity	Acquisition	-148dBm	-148dBm
	Tracking	-165dBm	-162dBm
	Re-acquisition	-160dBm	-157dBm
TTFF @ -130dBm	Hot Start	<1s	1s
	Warm Start	<5s (EASY™)	26s
	Cold Start	<15s (EASY™)	26s
Position Accuracy		2.5m CEP	4m CEP
Timing Accuracy	1PPS	10ns	10ns
Data Update Rate		Up to 10Hz	Up to 5Hz

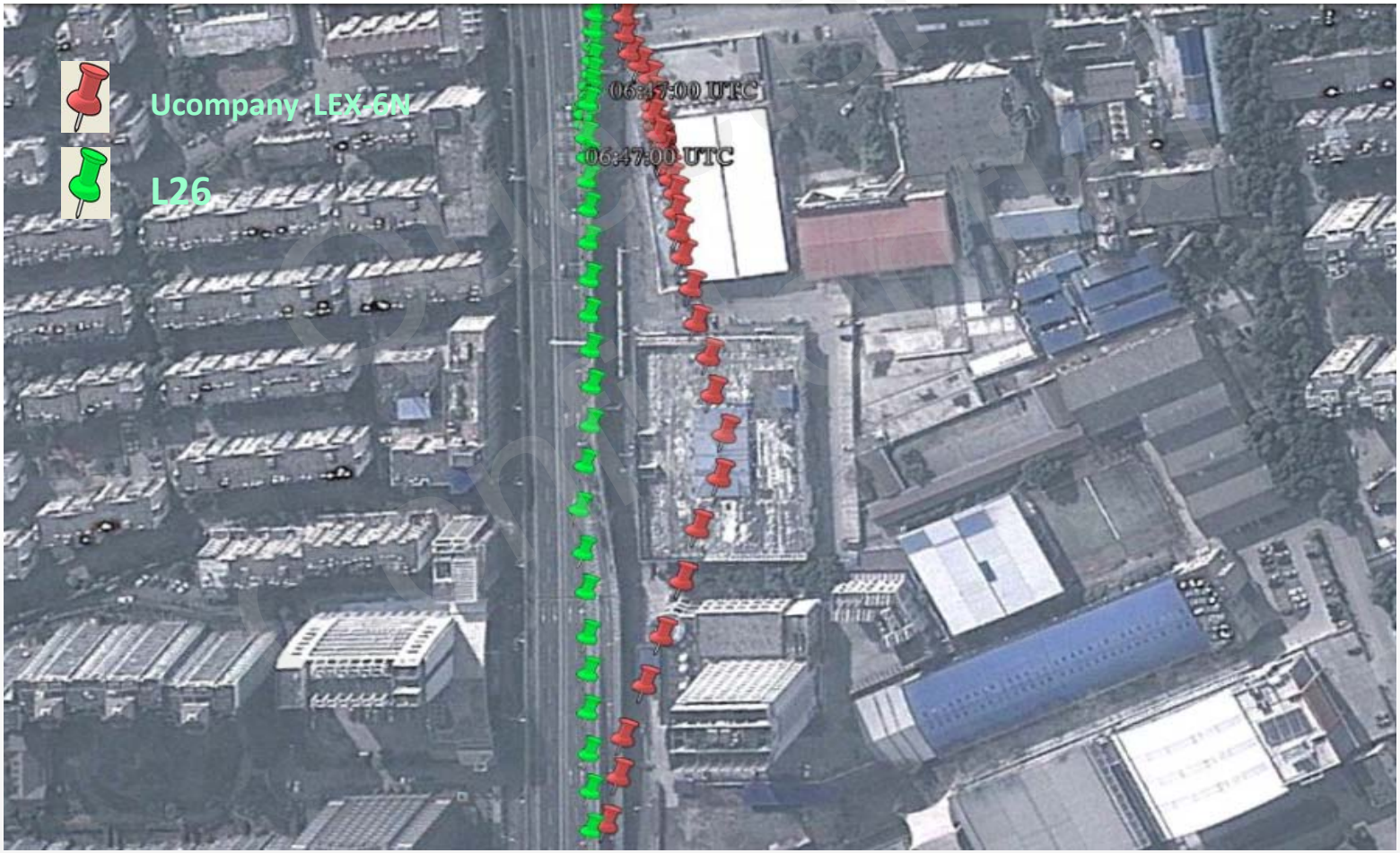
L26 vs. Ucompany LEX-6N(2)

➢ **Tracking Comparison**

When driving across overpass and making a turn, L26 module can still capture the accurate tracking data. But Ucompany module has a small drift.

L26 vs. Ucompany LEX-6N(3)

➢ **Tracking Comparison**



When driving under the overpass, L26 module shows its excellent performance. But Ucompany's module has a bigger drift.

Contents

- General description
  - Highlights
  - Mechanical Dimensions
  - Hardware Architecture
  - Firmware
  - Target Applications
- Features
  - Receiver Performance
  - Specifications
  - Self-AGPS EASY™ Technology
  - Periodic Standby Mode
  - AlwaysLocate™ Technology
  - L26 vs. Ucompany LEX-6N
- Support Package

Support Package(1)

Evaluation Board

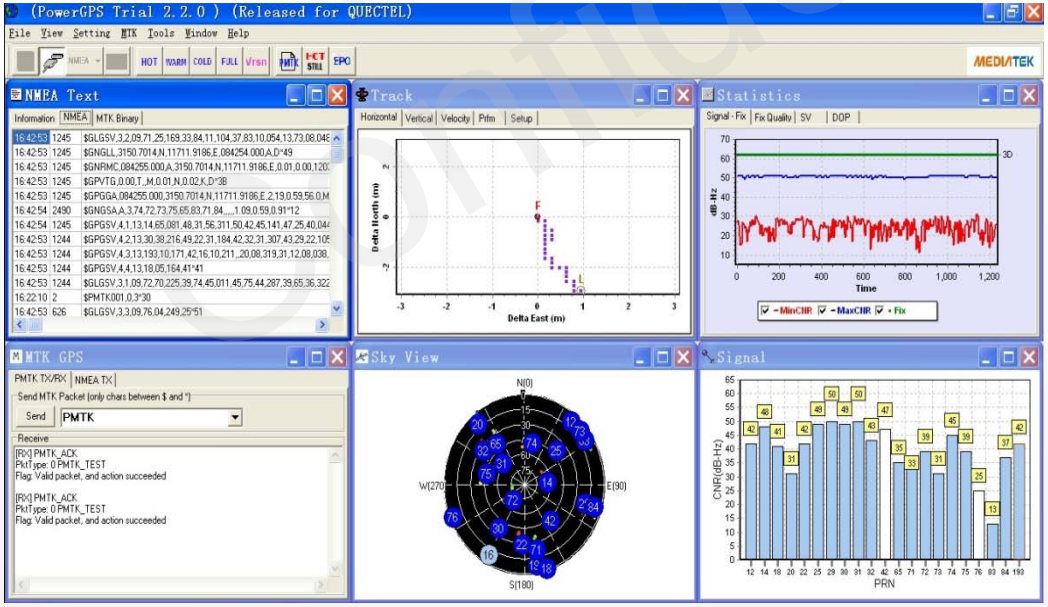
- Interfaces
  - GPS+GLONASS serial port
  - Antenna interface
  - Micro-USB interface

- Accessories
  - Micro-USB cable
  - GPS+GLONASS antenna

Support Package(2)

- Documents
  - <<Hardware Design>>
  - <<Protocol Specification>>
  - <<Part&Decal in PADS and Protel Format>>
  - <<Evaluation Board User Guide>>
  - <<Circuit Reference Design>>

- PC tool
  - PowerGPS2.2-GPS/GLONASS testing tool



QUECTEL
Wireless Module Expert

Thank you

Quectel Wireless Solutions Co., Ltd.
Room 501,Building 13,No.99 Tianzhou Road, Shanghai, China 200233
Tel：0086 21 51086236 Fax：0086 21 54453668

www.quectel.com