L70-R GPS Module Presentation

November, 2015

Contents

Highlights

MT3337 Single Chip Solution

66 acquisition channels
22 tracking channels

Extremely Compact Size

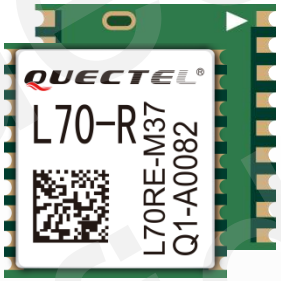
10.1 × 9.7 × 2.5mm

ROM-based Version

Cost efficient

Ultra Low Power Consumption

13mA@Tracking mode
16mA@Acquisition mode



Anti-Jamming

Multi-tone Active Interference canceller

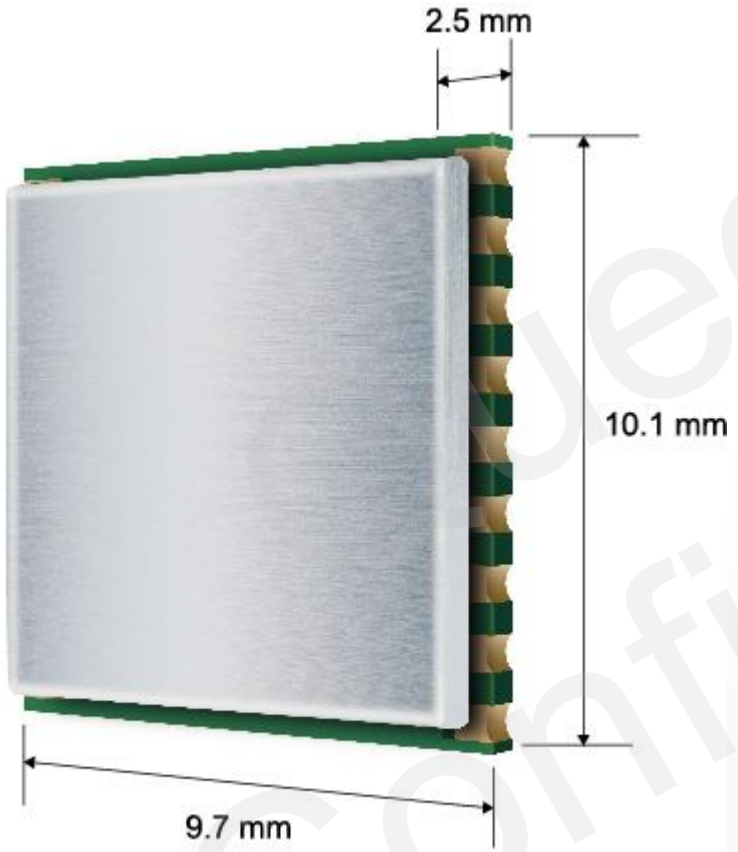
EASY™

Advanced AGPS technology
Without external memory

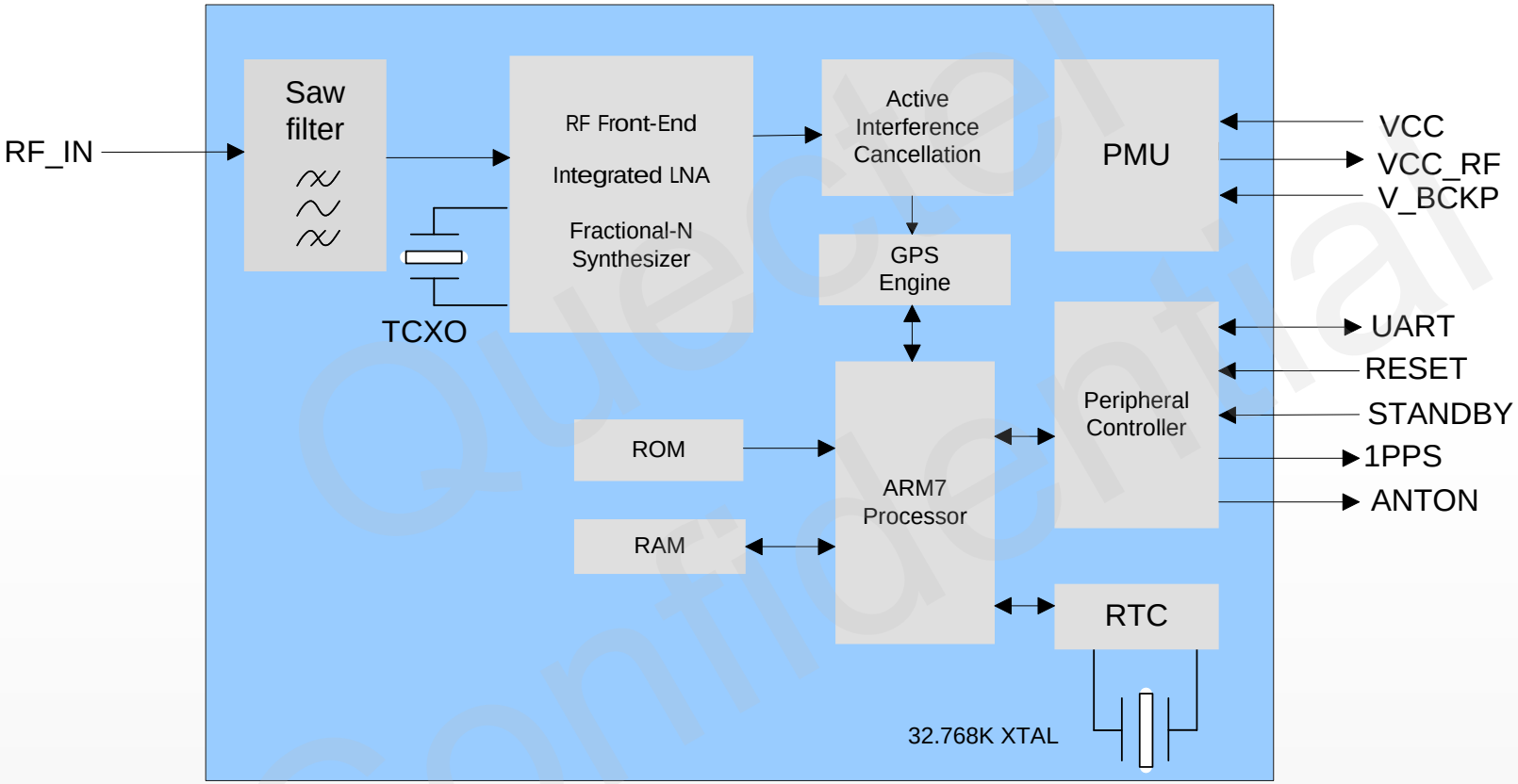
Highest Sensitivity

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

Mechanical Dimensions



Length:	10.1 mm
Width:	9.7 mm
Height:	2.5 mm
Weight:	0.6 g



Target Applications

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

Contents

Receiver Performance

- Extremely low power consumption in tracking mode, 13mA
- EASY™, advanced AGPS technology without the need of external memory
- High sensitivity, -165dBm@Tracking, -148dBm@ Acquisition
- 66 acquisition channels, 22 tracking channels
- Support QZSS
- Balloon mode, for high altitude up to 80km
- PPS VS. NMEA can be used in time service
- Anti-Jamming, Multi-tone Active Interference Canceller

Specifications

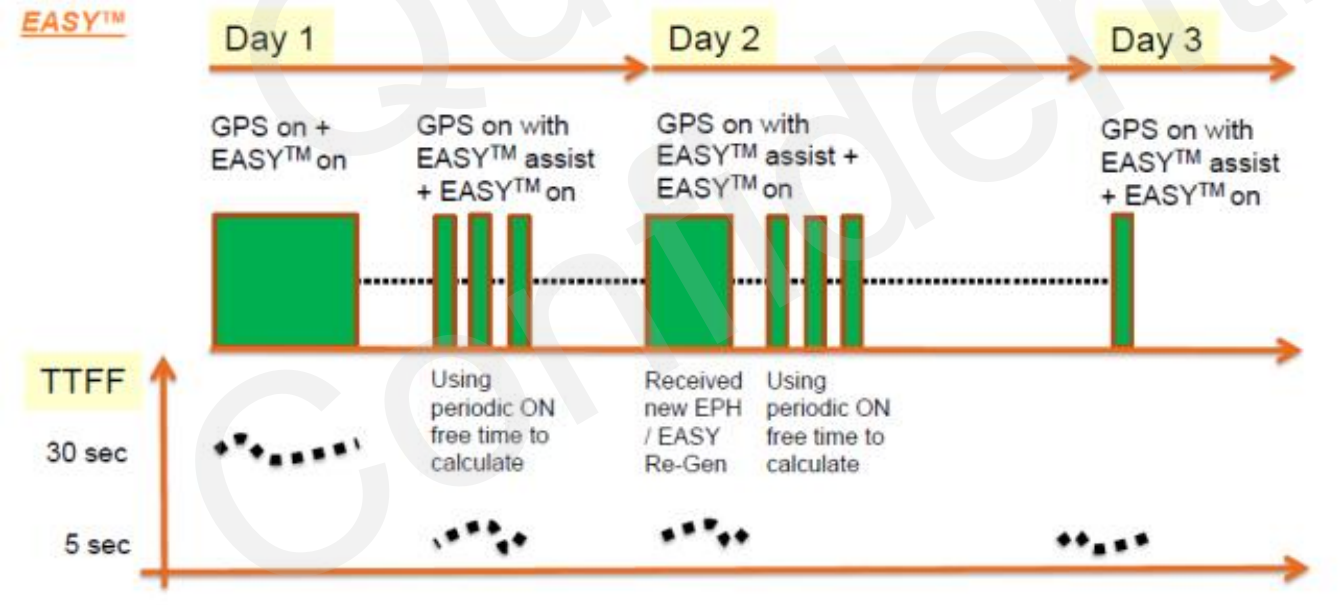
L1 Band Receiver (1575.42MHz)	Channel	22 (tracking) / 66 (acquisition)
	C/A code	
Horizontal Position Accuracy	Autonomous	<2.5m CEP
Velocity Accuracy	Without aid	<0.1m/s
Acceleration Accuracy	Without aid	0.1m/s²
Timing Accuracy	1PPS	10ns
Reacquisition Time		<1s
TTFF@-130dBm without EASY™	Cold Start	<35s
	Warm Start	<30s
	Hot Start	<1s
TTFF@-130dBm with EASY™	Cold Start	<15s
	Warm Start	<5s
	Hot Start	<1s
Sensitivity	Acquisition	-148dBm
	Tracking	-165dBm
	Re-acquisition	-160dBm

Environmental	Operation Temperature	-40℃ to 85℃
	Storage Temperature	-45℃ to 125℃
Dynamic Performance	Maximum Altitude	Max.18000m
	Maximum Velocity	Max.515m/s
	Maximum Acceleration	4G
Dimensions	10.1 × 9.7 × 2.5mm	
Weight	Approx. 0.6g	
Serial Interface	UART: Adjustable 4800~115200 bps Default: 9600bps	
Update Rate	1Hz by default, up to 5Hz	
I/O Voltage	2.7V ~ 2.9V	
Protocols	NMEA 0183 PMTK	
Power Supply	2.8V ~ 4.3V	
Power Acquisition	16mA	
Power Tracking	13mA	
Power Saving	8uA@Backup Mode	
	500uA@Standby 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 GPS 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 GPS 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 GPS signal Generator, conductive power level -130dBm	Cold Start	<35s	<15s
	Warm Start	<30s	<5 s

With EASY™ technology, L70-R accelerates TTFF obviously.

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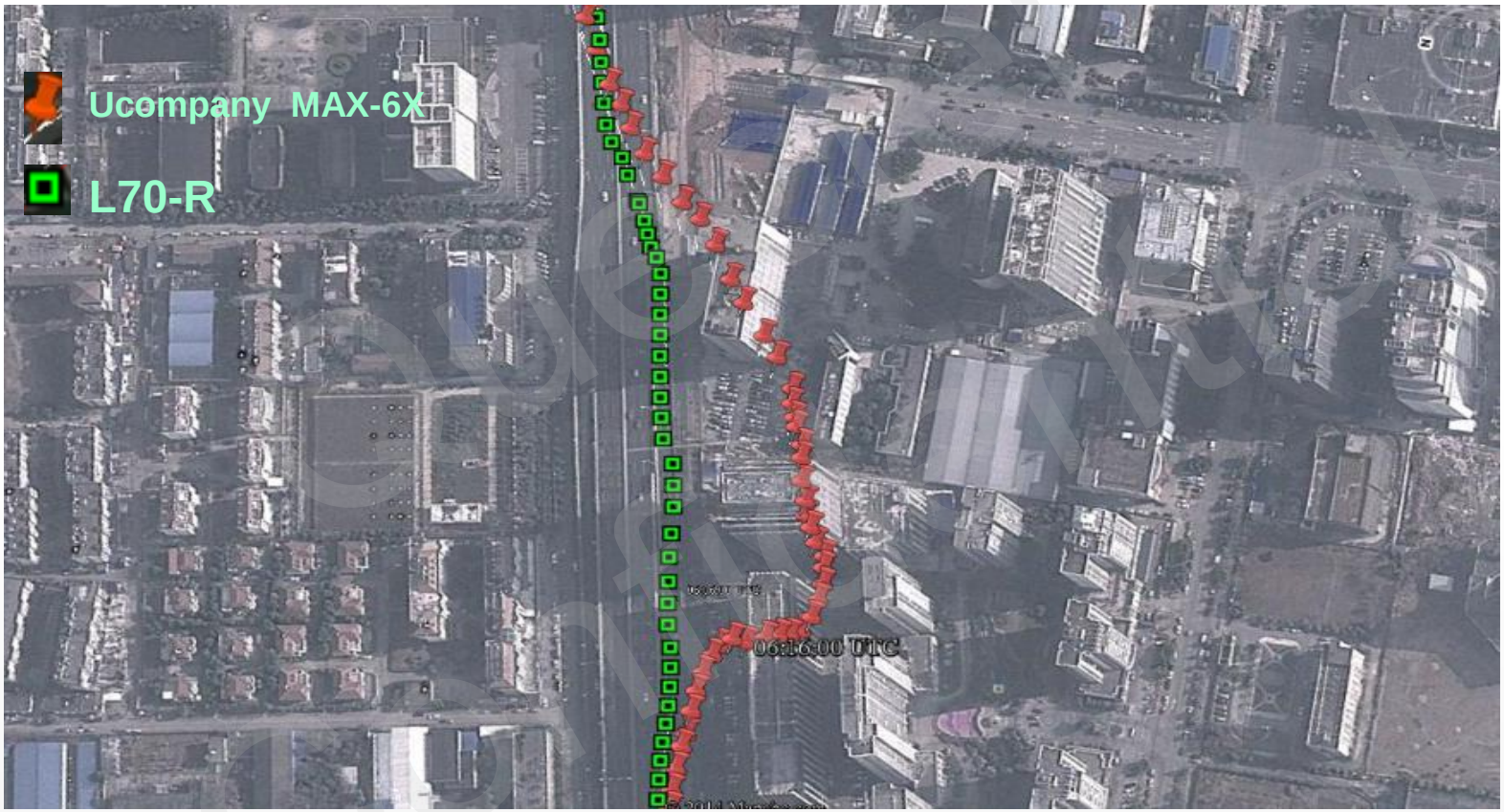
L70-R vs. Ucompany MAX-6X (1)

➢ Specification Comparison

		L70 -R	MXX-6X
Packaging		18-pin LCC GPS module	18-pin LCC GPS module
Dimensions		10.1 × 9.7 × 2.5 mm	10.1 × 9.7 × 2.5 mm
Sensitivity	Autonomous Acquisition	-148dBm	-147dBm
	Reacquisition	-160dBm	-160dBm
	Hot Start	-160dBm	-156dBm
	Tracking	-165dBm	-161dBm
Timing Accuracy		<15ns	30ns RMS
Update Rate		1Hz(default), Max 5Hz	1Hz(default), Max 5Hz
Temperature Range	Operation	-40℃ to 85℃	-40℃ to 85℃
	Storage	-45℃ to 125℃	-40℃ to 85℃
Power Supply		2.8V to 4.3V	2.7V to 3.6V (MXX-6Q) 1.75V to 2.0V (MXX-6G)
Full Power Consumption	Acquisition	16mA@3.3V	47mA
	Tracking	13mA@3.3V	41mA
Power Saving Mode Consumption	Standby mode	500uA	36mW @ 3.0V 22mW @ 1.8V
	Backup mode	8uA	22uA
Embedded external LNA (Outside Chipset)		No	No
Feature	EASY ™	Supported	Not supported
	1PPS	Supported	Support(Time Pulse)

L70-R vs. Ucompany MAX-6X(2)

➢ Tracking Comparison



When driving under the overpass, L70-R module shows its excellent performance. But Ucompany's module has a bigger drift.

L70-R vs. Ucompany MAX-6X(3)

➢ Tracking Comparison

When driving across overpass and making a turn, L70-R module can still capture the accurate tracking data. But Ucompany module has a small drift.

Contents

Support Package (1)

Evaluation Board

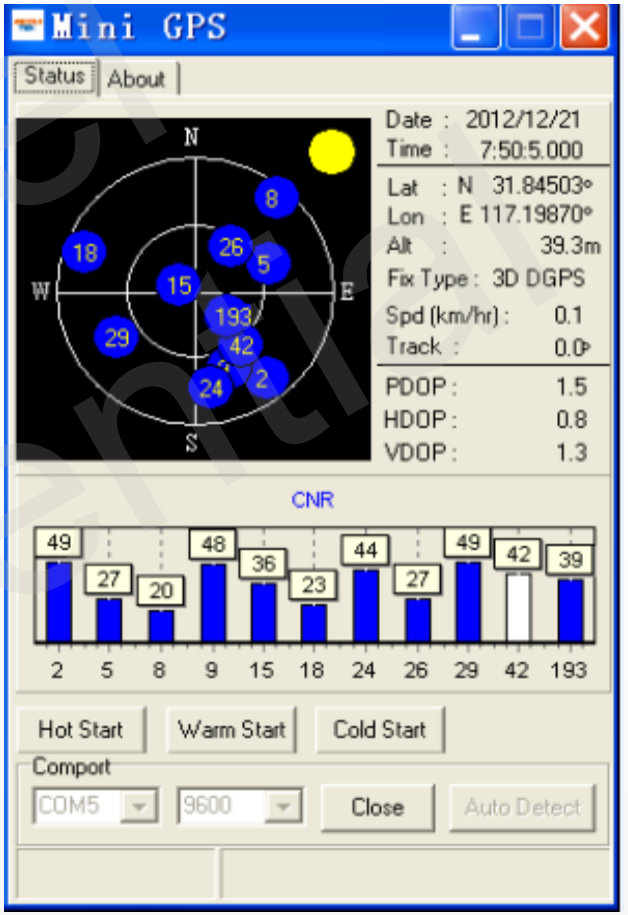
- **Interfaces**
  - GPS serial port
  - Antenna interface
  - Micro-USB interface

- **Accessories**
  - Micro-USB cable
  - GPS 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**
  - MiniGPS-GPS testing tool



Q&A…

Thank you