L80-R GPS Module Presentation

November, 2015

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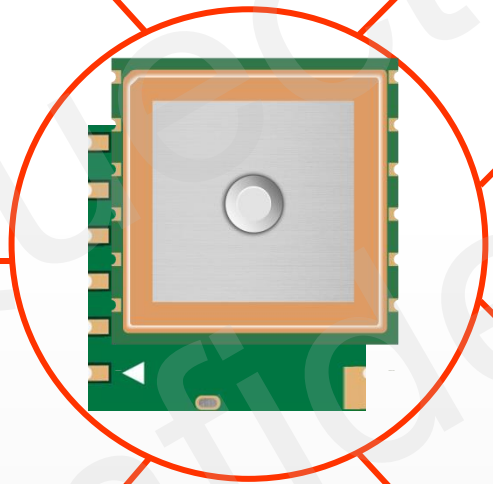
Highlights

MT3337 Single Chip Solution

66 acquisition channels
22 tracking channels

Embedded Patch Antenna

15.0 x 15.0 x 4.0 mm
Automatic antenna switching function



ROM-based Version

Cost efficient

Ultra Low Power Consumption

20mA@Tracking mode
25mA@Acquisition mode

Anti-Jamming

Multi-tone Active Interference canceller

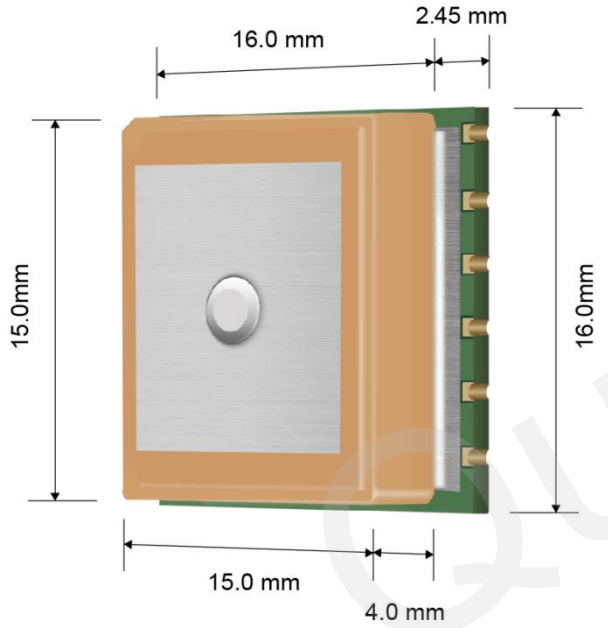
EASY™

Advanced AGPS technology without external memory

Highest Sensitivity

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

Mechanical Dimensions



- L80-R Module Dimensions

Length:	16.0 mm
Width:	16.0 mm
Height:	6.45 mm
Weight:	6.0 g

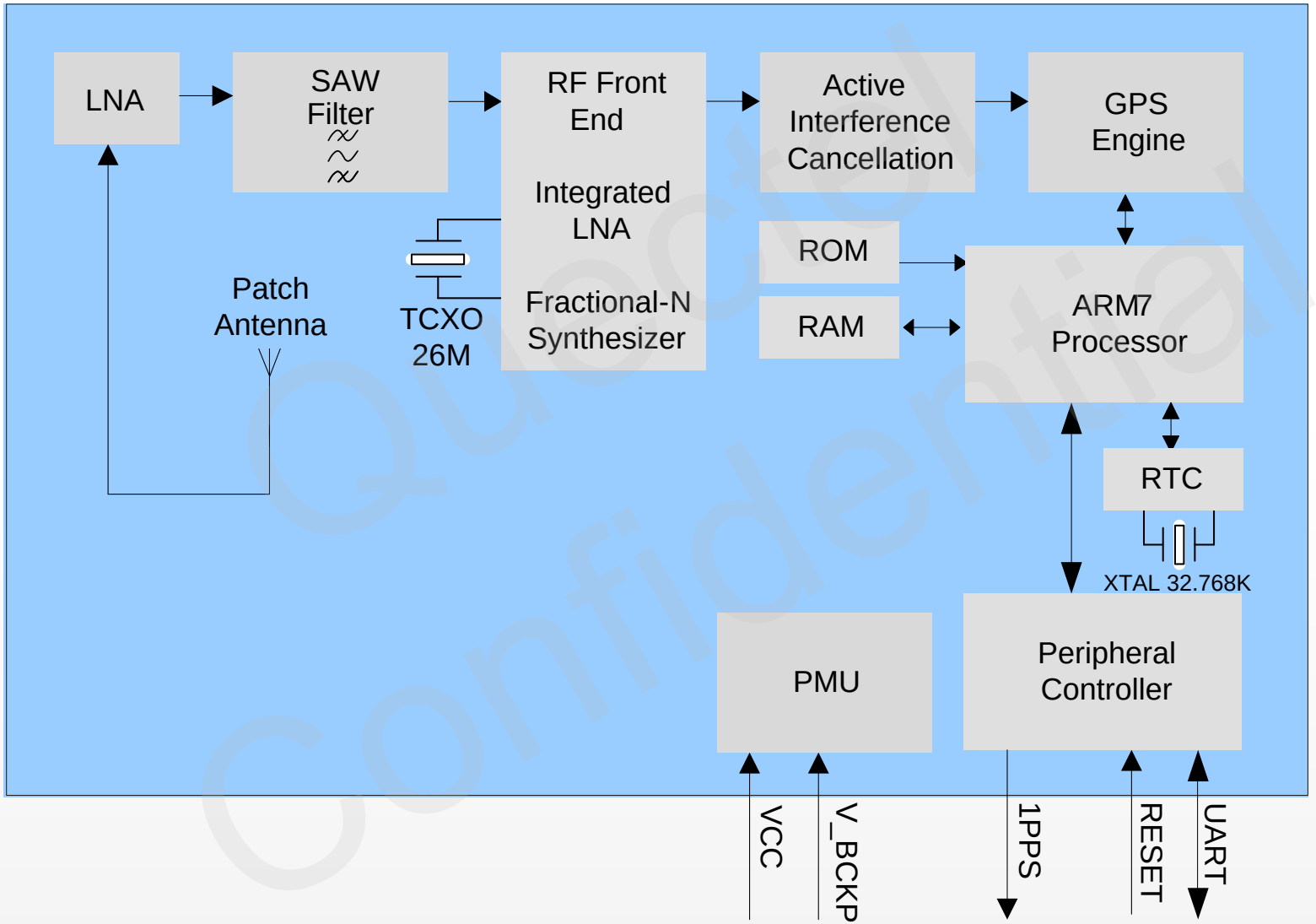
- Patch Antenna Dimensions

Length:	15.0 mm
Width:	15.0 mm
Thickness:	4. 0 mm

Advantages of L80-R's mechanical dimensions:

1. The compact form factor of L80-R is only 16.0mm x 16.0mm x 6.45mm and the patch antenna is on the top of L80-R. So it can saves more space of customer's PCB.
2. With LCC package and integrated with 15 x 15 x 4mm patch antenna, L80-R has the high level of performance both in acquisition and tracking. The thickness of the patch antenna is 4mm, which not only improves the accuracy of positioning, but also avoids interference from other components or external environments.

Hardware Architecture



Target Applications

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

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Receiver Performance

- EASY™, advanced AGPS technology without the need of external memory
- Embedded patch antenna: 15.0 x 15.0 x 4.0mm
- Extremely compact size: 16.0 x 16.0 x 6.45mm
- Built-in LNA for better sensitivity
- Extremely low power consumption, 20mA@tracking mode
- 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

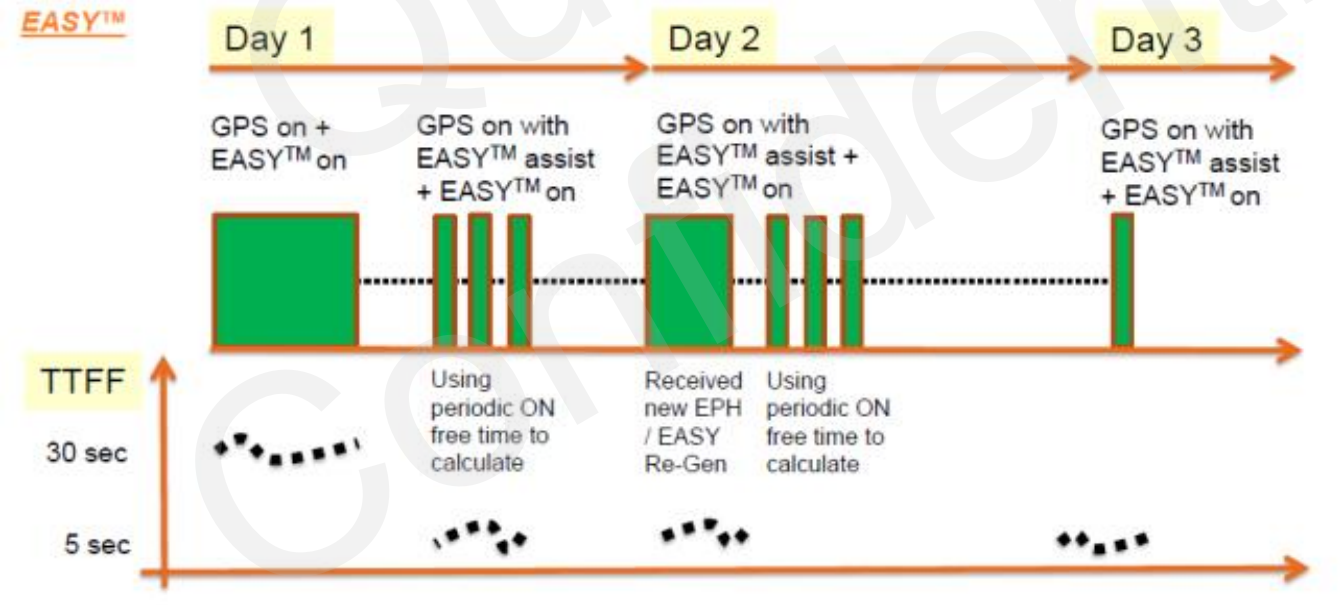
L1 Band Receiver (1575.42MHz)	Channel	22 (tracking) / 66 (acquisition)
	C/A code	
Horizontal Position Accuracy	Autonomous	<2.5m CEP
Velocity Accuracy	Without aid	<0.1m/s
Acceleration Accuracy	Without aid	0.1m/s²
Timing Accuracy	1PPS	10ns
Reacquisition Time		<1s
TTFF@-130dBm with EASY™	Cold Start	<15s
	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 16.0 x 6.45mm	
Weight	Approx. 6.0g	
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	3.0V ~ 4.3V	
Power Acquisition	25mA	
Power Tracking	20mA	
Power Saving	7uA@Backup Mode	
	1mA@Standby Mode	

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, L80-R accelerates TTFF obviously.

Advantages of Soldering(1)

➢ L80-R is a GPS POT (Patch on Top) module. Its patch antenna's feed point is embedded in the PCB. So the feed point is concave, rather than convex. There is no need to hollow out the feed point.

➢ L80-R has 12 pins, which are very practical and easy for SMD soldering. Meanwhile, the pins are easily soldered by manual because of its large size (length=1.5mm; width=1.0mm).

Advantages of Soldering(2)

➢ L80-R can be easily soldered into all kinds of evaluation boards through five cables (RXD, TXD, VCC, GND and V_BCKP), which is convenient for different customers to evaluate the module's performance on their own boards.

➢ Base on simple design and tiny size, L80-R module is suitable for special applications, such as GPS mouse, OBD, and etc.

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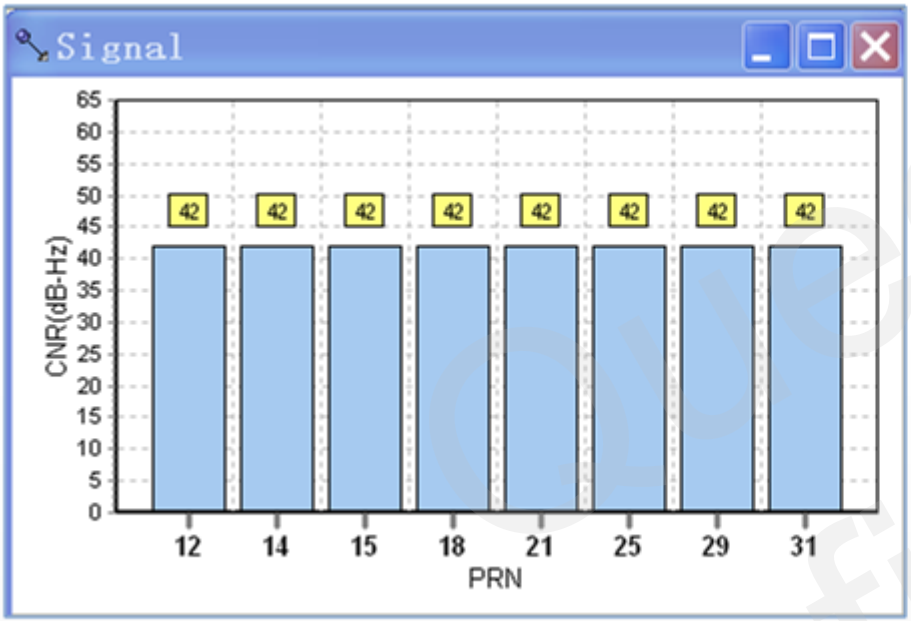
L80-R vs. Ucompany CAM-M8X (1)

➢ Specification Comparison

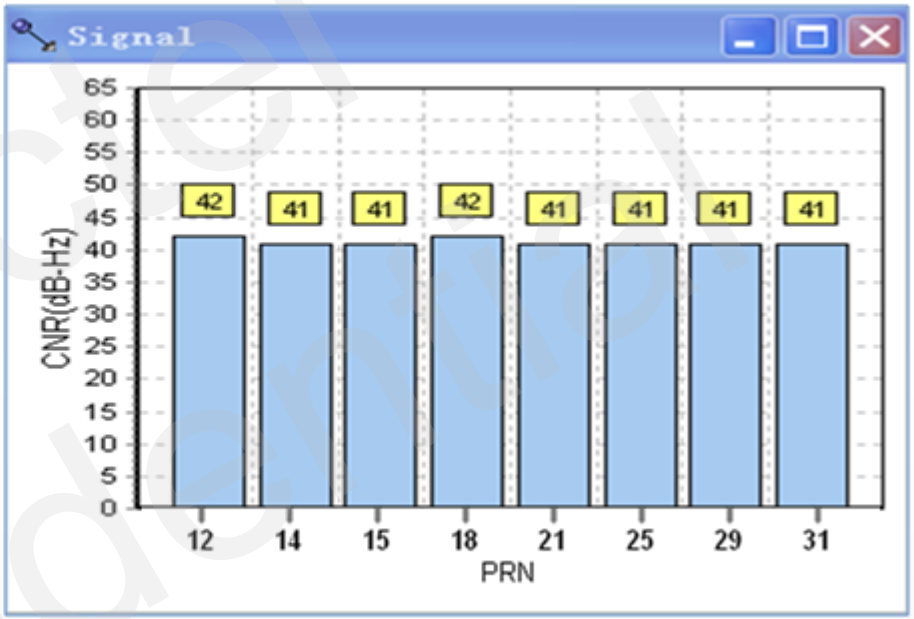
Product Features		L80-R (Patch Antenna)	CAM-M8X(Chip Antenna)
Power Supply		3.0V~4.3V	2.7V~3.6V
Power Consumption	Acquisition Mode	25mA	25mA
	Tracking Mode	20mA	23.5mA
Sensitivity	Acquisition	-148dBm	-148dBm
	Tracking	-165dBm	-166dBm
	Re-acquisition	-160dBm	-160dBm
TTFF @ -130dBm	Hot Start	<1s	1s
	Warm Start	<5s (EASY™)	27s
	Cold Start	<15s (EASY™)	29s
Position Accuracy		2.5m CEP	2.5m CEP
Timing Accuracy	1PPS	15ns	30ns
Data Update Rate		Up to 5Hz	Up to 18Hz

L80-R vs. Ucompany CAM-M8X (2)

➢ CN Value (-110dBm@SV=8）with coupling testing



L80-R



CAM-M8X

Note: CN value is measured by a 8-channel GPS signal simulator under coupling testing mode with a-110dBm signal level.

L80-R vs. Ucompany CAM-M8X (3)

➢ TTFF Comparison

L80-R patch antenna with EASY				CAM-M8X			
CN0 39dB				CN0 39dB			
	cold start	warm start	hot start		cold start	warm start	hot start
1	14.3	2.7	0.6	1	32.9	22.1	1
2	16.7	3.8	0.4	2	33.4	21.3	0.7
3	17.8	3	0.7	3	27.4	21.8	0.8
4	12.5	5.4	0.9	4	32.7	32.6	0.5
5	13.7	4.6	0.5	5	20.1	31.4	0.8
6	16	3.8	0.4	6	19.1	32.3	0.7
7	21.2	3.8	0.6	7	29.8	25.6	0.6
8	12.6	4.5	0.4	8	30.6	33	0.6
9	15	3.1	0.7	9	31.8	29.4	0.7
10	13.6	3.2	0.9	10	35.9	24.1	0.5
min	12.5	2.7	0.4	min	19.1	21.3	0.5
max	21.2	5.4	0.9	max	35.9	33	1
mean	**15.34**	**3.8**	**0.61**	mean	**29.4**	**27.3**	**0.69**

With EASY™ technology, L80-R accelerates TTFF obviously.

Contents

Support Package (1)

Evaluation Board

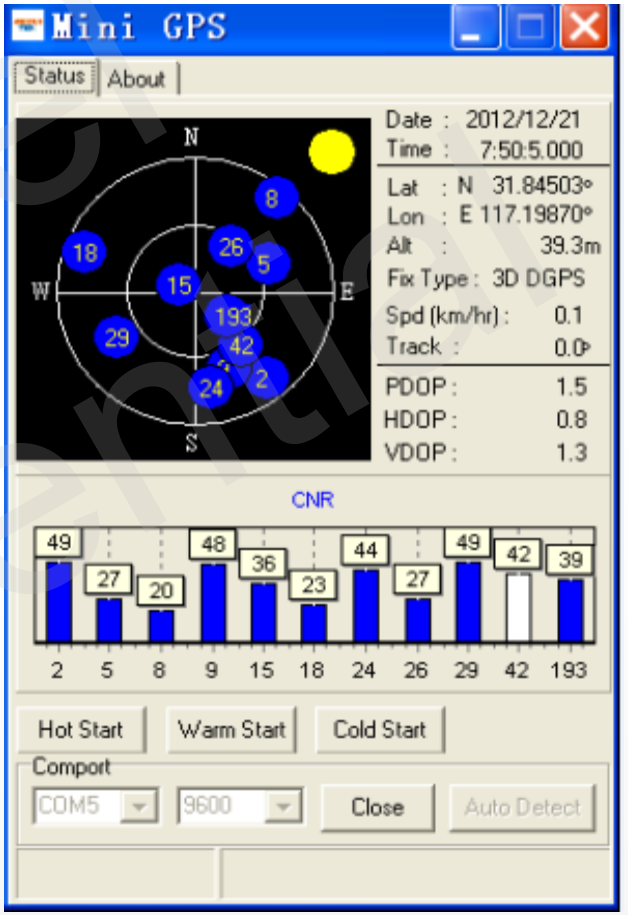
- Interfaces
  - GPS serial port
  - Active Antenna interface
  - Micro-USB interface

- Accessories
  - Micro-USB cable

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