



L10

Quectel GPS Engine

L10 User Guide

L10_User_Guide_V1.00



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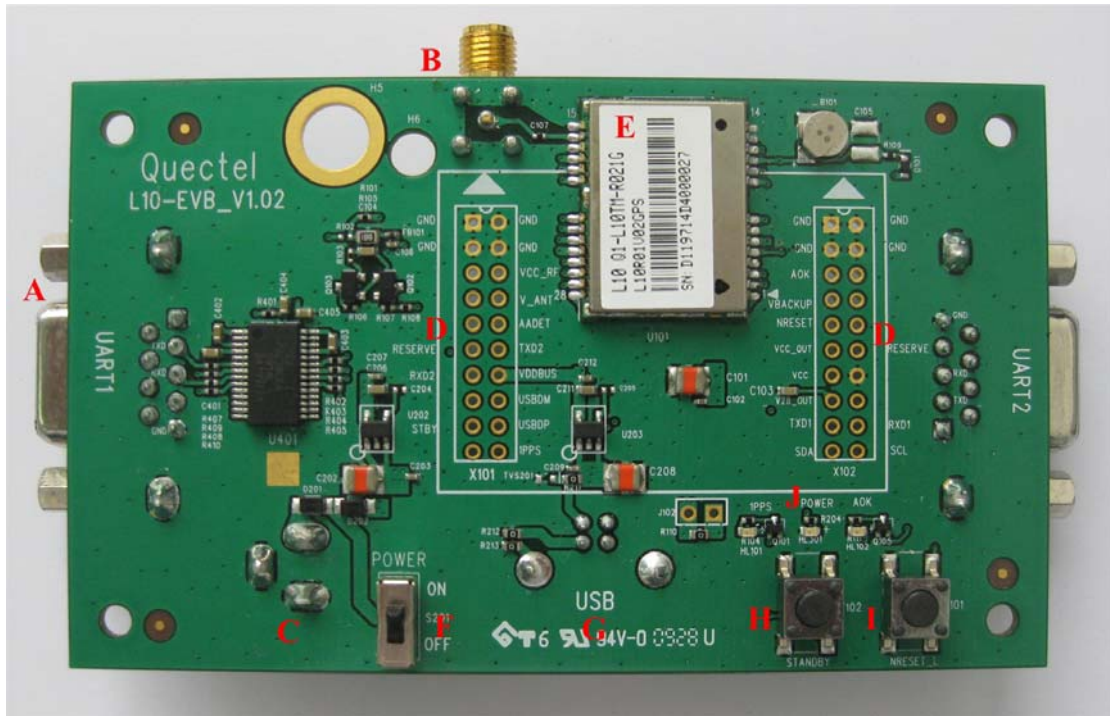
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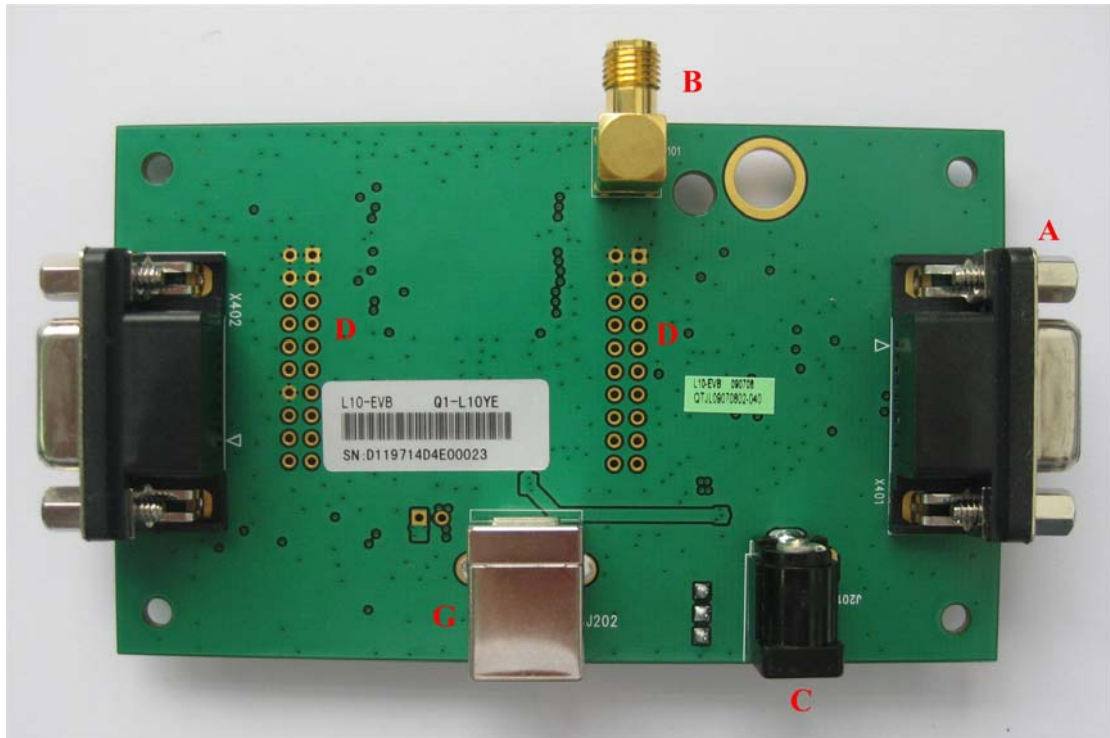
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1. EVB Kit Introduction

1.1 EVB Top and Bottom View



EVB top view



EVB bottom view

- A: UART port
- B: Antenna interface
- C: Adapter interface
- D: Test points
- E: L10 Module
- F: POWER switch
- G: USB interface
- H: STANDBY button
- I: RESET button
- J: Indication LEDs

1.2 EVB Accessories



EVB accessories

- A: GPS active antenna (3.3V)
- B: DC5V/2A power adapter
- C: Serial port cable (USB 2.0)
- D: USB cable

1.3 EVB and Accessories

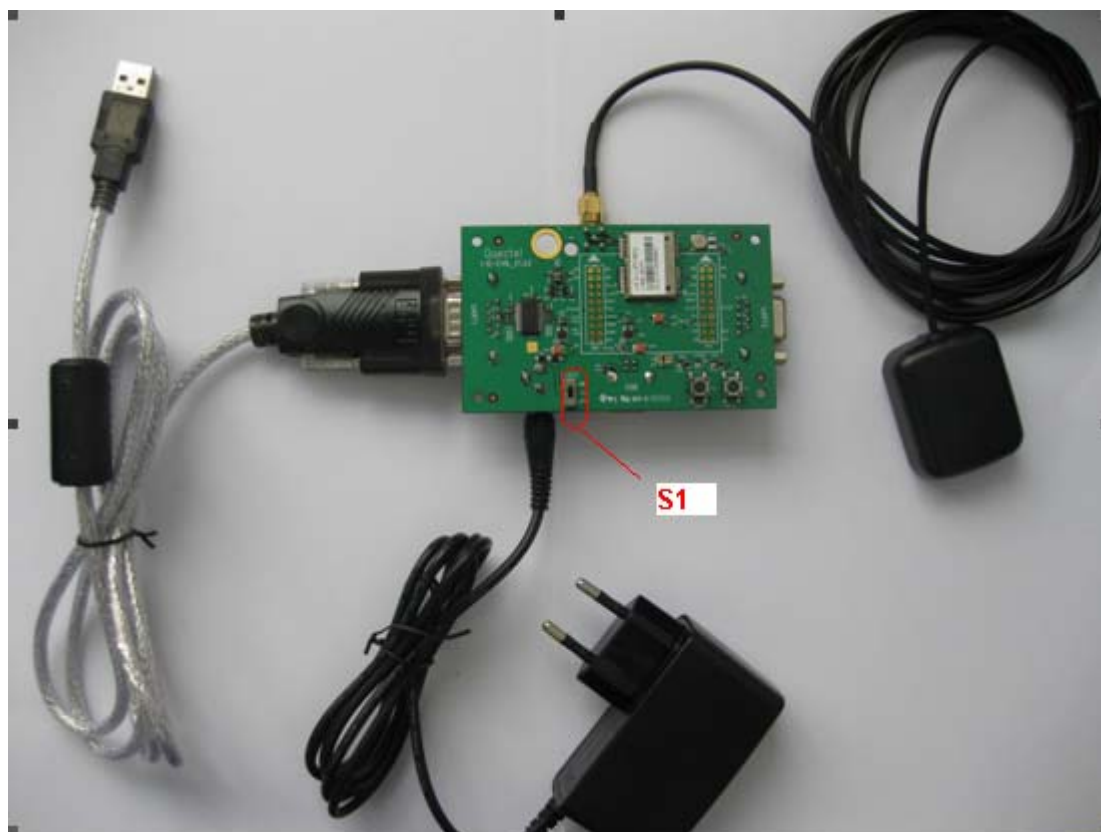
When USB to RS232 cable is used, the EVB and its accessories are equipped as shown in Figure 12.



EVB and accessory equipments with serial cable

2. Operational description

2.1 Tune on the module



switching the “S1” switch to ON state; and the module is tuning on successfully.

2.2. L10 features

2.2.1 General specification

The L10 GPS module brings the high performance of the MTK positioning engine to the industrial standard. The module supports 210 PRN channels. With 66 search channels and 22 simultaneous tracking channels, it acquires and tracks satellites in the shortest time even at indoor signal level. This versatile, stand-alone receiver combines an extensive array of features with flexible connectivity options. The embedded FLASH memory provides capacity for storing user-specific configuration settings and allows for future updates. L10 advanced jamming suppression mechanism and innovative RF architecture provides a high level of immunity for jamming, ensuring maximum GPS performance.

The L10 is an SMD type module with the compact 22.4mm x 17.0mm x 3.0 mm form factor, which can be embedded in customer applications through the 28-pin pads. It provides all hardware interfaces between the module and customer’s board.

- The UART port can help to develop customer’s application easily.
- The USB port is available for faster data transmission and more flexibility
- The antenna interface supports passive and active antenna.

2.2.2 Hardware Specification

The L10 GPS module brings the high performance of the MTK positioning engine to the industrial standard. The module supports 210 PRN channels. With 66 search channels and 22 simultaneous tracking channels, it acquires and tracks satellites in the shortest time even at indoor signal level. This versatile, stand-alone receiver combines an extensive array of features with flexible connectivity options. The embedded FLASH memory provides capacity for storing user-specific configuration settings and allows for future updates. L10 advanced jamming suppression mechanism and innovative RF architecture provides a high level of immunity for jamming, ensuring maximum GPS performance. The module supports location, navigation and industrial applications including autonomous GPS C/A, SBAS (including WAAS, EGNOS, MSAS), DGPS (RTCM), and AGPS.

The L10 is an SMD type module with the compact 22.4mm x 17.0mm x 3.0 mm form factor, which can be embedded in customer applications through the 28-pin pads. It provides all hardware interfaces between the module and customer’s board.

- The UART port can help to develop customer’s application easily.
- The USB port is available for faster data transmission and more flexibility
- The antenna interface supports passive and active antenna.

The PCB of M10 is 4 layers.

2.2.3 Software and other specifications

Feature	Implementation
Power supply	Single supply voltage: 3.0V – 4.3V typical : 3.3V
Power consumption (passive antenna)	<ul style="list-style-type: none"> ● Acquisition 43mA ● Tracking 38mA ● Standby TBD
Receiver Type	<ul style="list-style-type: none"> ● GPS L1 1575.42MHz C/A Code ● 66 search channels, 22 simultaneous tracking channels
Sensitivity	<ul style="list-style-type: none"> ● Cold Start (Autonomous) -147 dBm

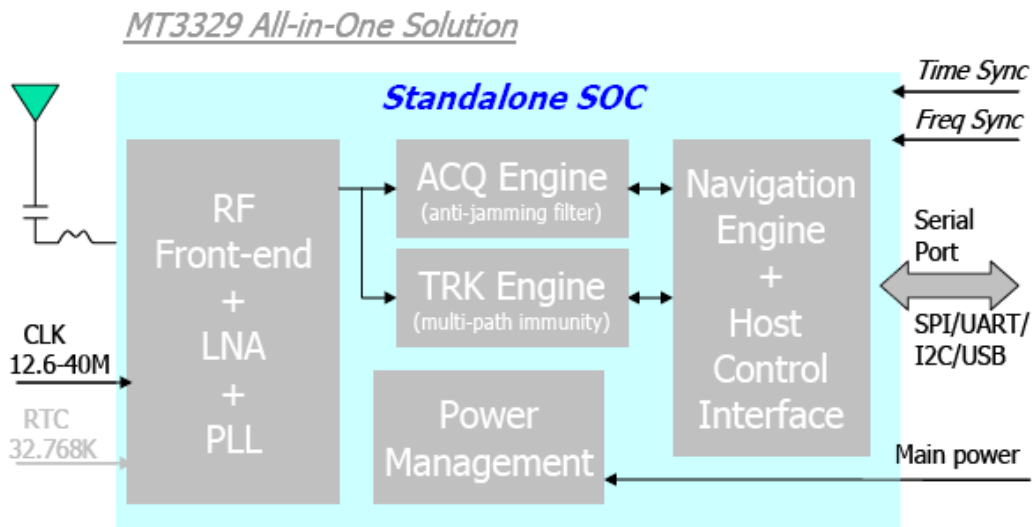
	<ul style="list-style-type: none"> ● Reacquisition -160 dBm ● Hot start -160 dBm ● Tracking -165 dBm
Time-To-First-Fix	<ul style="list-style-type: none"> ● Cold Start (Autonomous) 35s average ● Warm Start (Autonomous) 35s average ● Hot Start (Autonomous) <1.2 s ● EPO, BEE 5 ~ 10s ● SUPL 5 ~ 10s
Position Accuracy	<ul style="list-style-type: none"> ● Without Aid 3.0 m 2D-RMS ● DGPS 2.5 m
Max Update Rate	<ul style="list-style-type: none"> ● 10Hz
Accuracy of 1PPS Signal	<ul style="list-style-type: none"> ● Typical accuracy 61 ns ● Time pulse adjustable from 1ms to 999ms, default 100ms
Velocity Accuracy	<ul style="list-style-type: none"> ● Without Aid 0.1 m/s ● DGPS 0.05 m/s
Acceleration Accuracy	<ul style="list-style-type: none"> ● Without Aid 0.1 m/s² ● DGPS 0.05 m/s²
Dynamic Performance	<ul style="list-style-type: none"> ● Maximum Altitude 18,000 m ● Maximum Velocity 515 m/s Maximum ● Acceleration 4 G
UART Port	<ul style="list-style-type: none"> ● UART Port: two lines TXD1 and RXD1 ● Supports baud rate from 4800bps to 115200bps. ● UART Port is used for NMEA outputting or inputting , PMTK private messages inputting and firmware upgrade
USB Port	<ul style="list-style-type: none"> ● Support USB 2.0 full-speed compatible ● USB Port is used for NMEA outputting or inputting , PMTK private messages inputting and firmware upgrade
Temperature range	<ul style="list-style-type: none"> ● Normal operation: -40°C ~ +85°C ● Storage temperature: -45°C ~ +125°C
Physical Characteristics	Size: 22.4±0.15 x 17±0.15 x 3.0±0.1mm Weight: about 2.2g
Firmware Upgrade	Firmware upgrade over UART port or USB port

2.2.4 Solution of L10

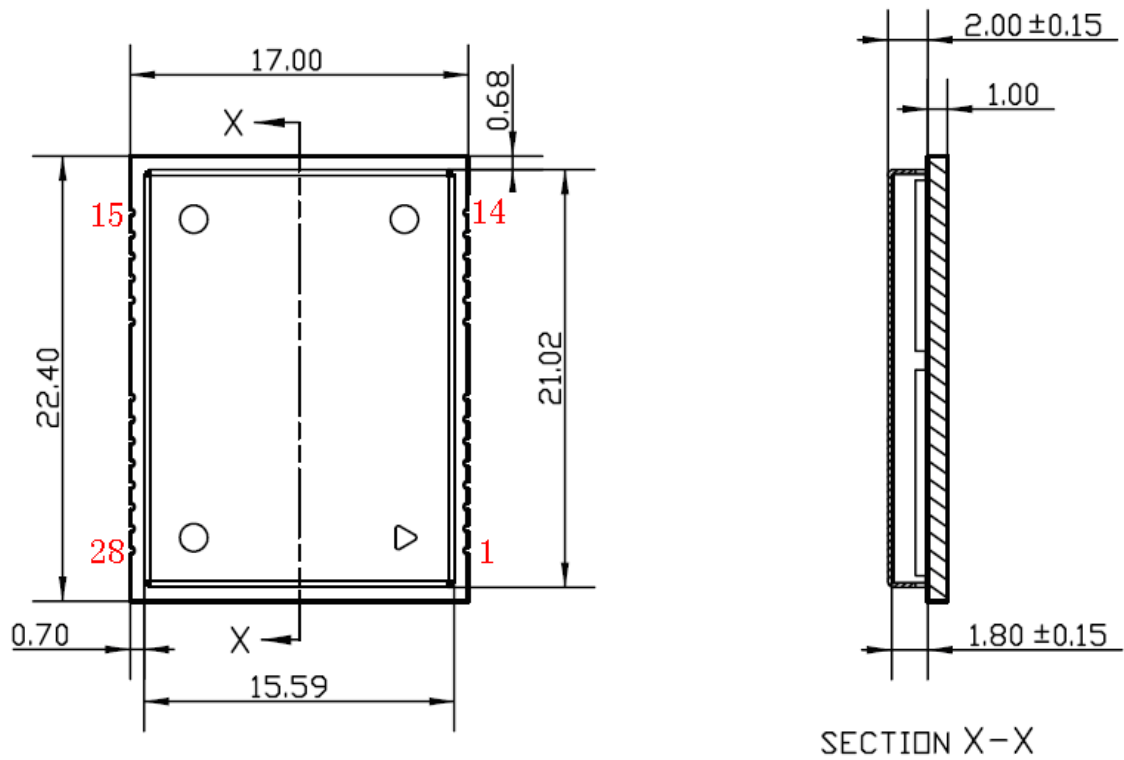
The hardware solution is MT3329; The software solution is MTK Release GPS AXN.

MT3329

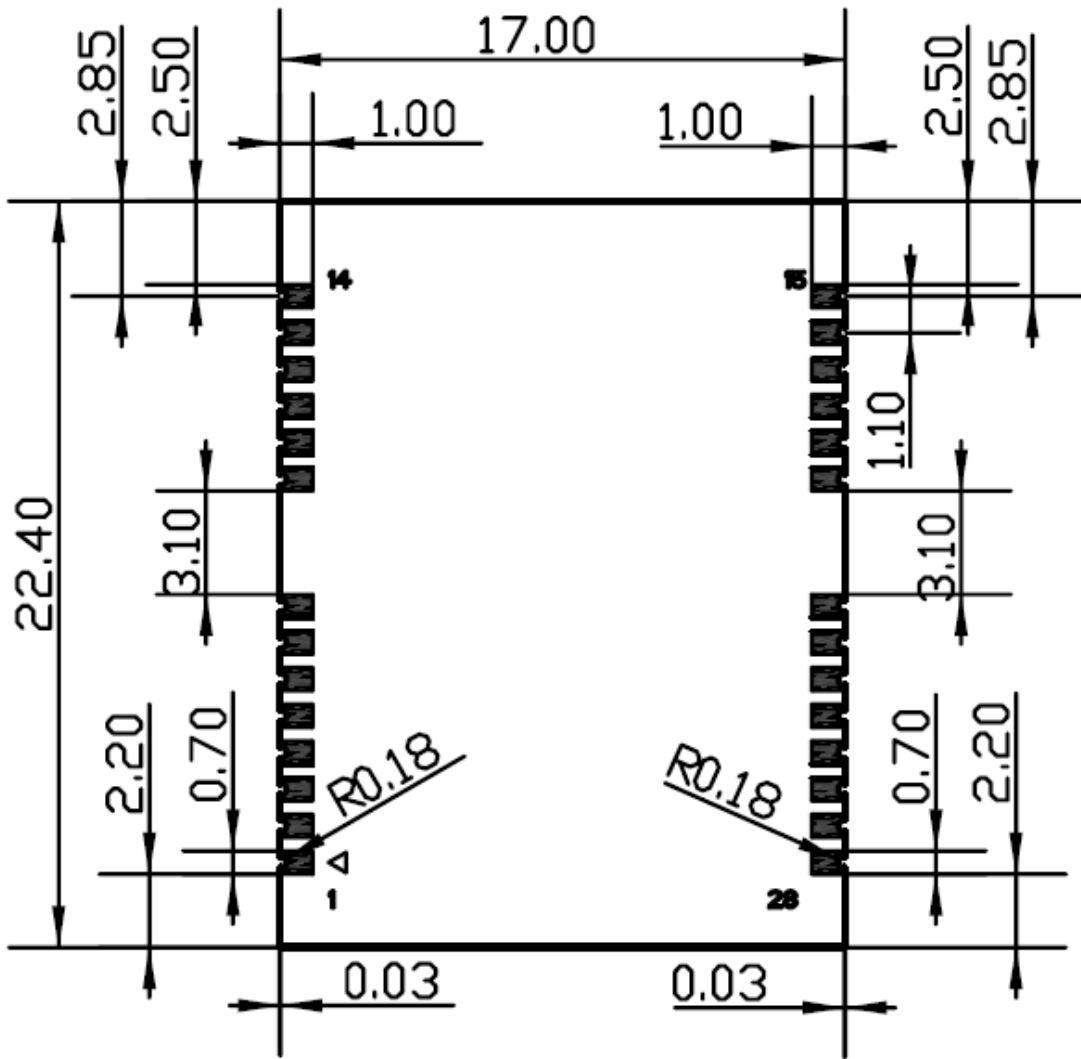
MT3329, a high performance single chip GPS navigation solution, which includes on chip CMOS RF, digital baseband, and an optional embedded flash. It achieves the industry's highest levels of sensitivity, accuracy, and Time-to-First-Fix (TTFF) with lowest power consumption in a small-footprint lead-free package.



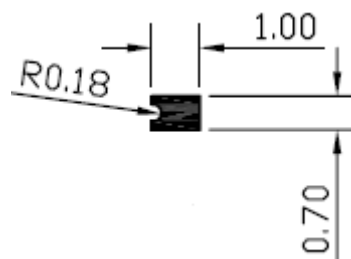
2.2.5 Mechanical architecture



L10 Top view and Side dimensions (Unit:mm)



L10 Bottom dimensions (Unit:mm)



PAD Bottom dimensions (Unit: mm)

3. GPS Protocol

Please see the document of L10_GPS_Protocol.

4. Compliance with FCC Regulations

FCC Section 15.21 Information to the user

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Section 15.19 Labelling requirements

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

When the L10 is integrated into a final product, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily removed. If not, a second label must be placed on the outside of the final device that contains the following text:

“Contains FCC ID: **XMR-16182009003**” L10 FCC label is shown as:



Section 15.105 (b)

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the

instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

QUECTEL



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