

Product name	Description	Version
RTK-1612AD-DR	High-precision untethered dead reckoning module	0.1



1 Introduction

LOCOSYS RTK-1612AD-DR uses an Airoha AG3335AD chip, dual-frequency multi-constellation solution GNSS, providing RTK high precision and sensor fusion solution in one. It not only supports GPS, GLONASS, GALILEO, BEIDOU, and QZSS but also has inertial sensors (3-axis accelerometers and 3-axis gyros) to provide an untethered dead reckoning function.

In addition to DR, an inertial sensor can detect the vehicular dynamics when it is attached firmly on the vehicle. Consequently, abnormal driving behaviors and the vehicle status can be detected and the alarm status will be enabled to remind the users. No requirement of installation orientation and automatic calibration function make it easy to use. With these features, RTK-1612AD-DR can reduce position errors in multipath environment and continue to work where GNSS signals are poor or not available, such as tunnels and indoor parking lots, as well as deliver seamless navigation.

2 Features

- Build on high performance, low-power Airoha AG3335AD chip
- Dual-frequency multi-constellation GNSS RTK positioning and dead reckoning.
- Support GPS, GLONASS, GALILEO, BEIDOU and QZSS
- Capable of SBAS (WAAS, EGNOS, MSAS, GAGAN)
- Support 135-channel GNSS
- Built-in TDK-42670-P 6-axis MEMS (3-axis gyroscope and 3-axis accelerometer)
- UDR Mode CEP \leq 3% of distance travelled without GNSS
- Alarm statuses detected by VMDS
- No requirement for installation orientation
- Small form factor 16 x 12.2 x 2.6 mm
- SMD type with stamp holes; RoHS compliant

3 Application

- Automotive navigation
- LBS (location Base Service)
- Vehicle Remote Monitoring
- ITS (Intelligent Traffic System)

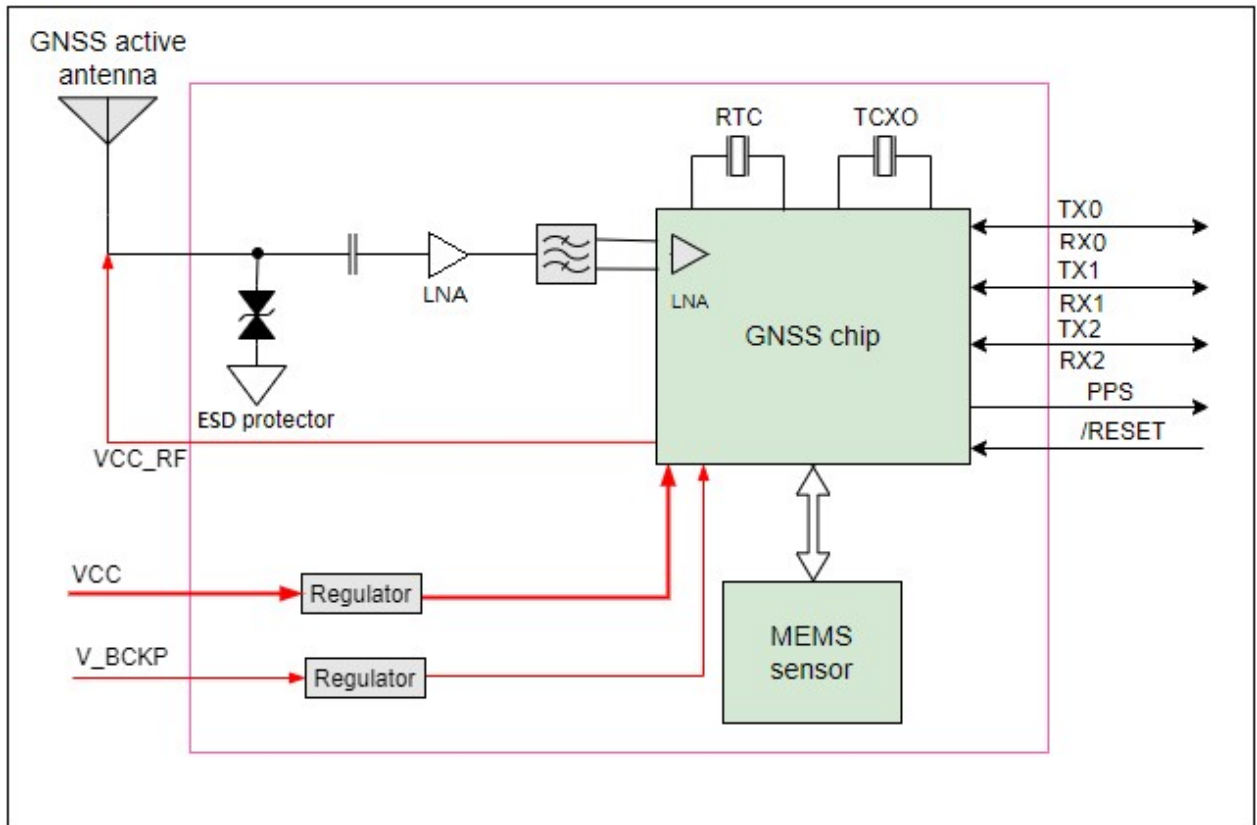


Fig 3-1 System block diagram.

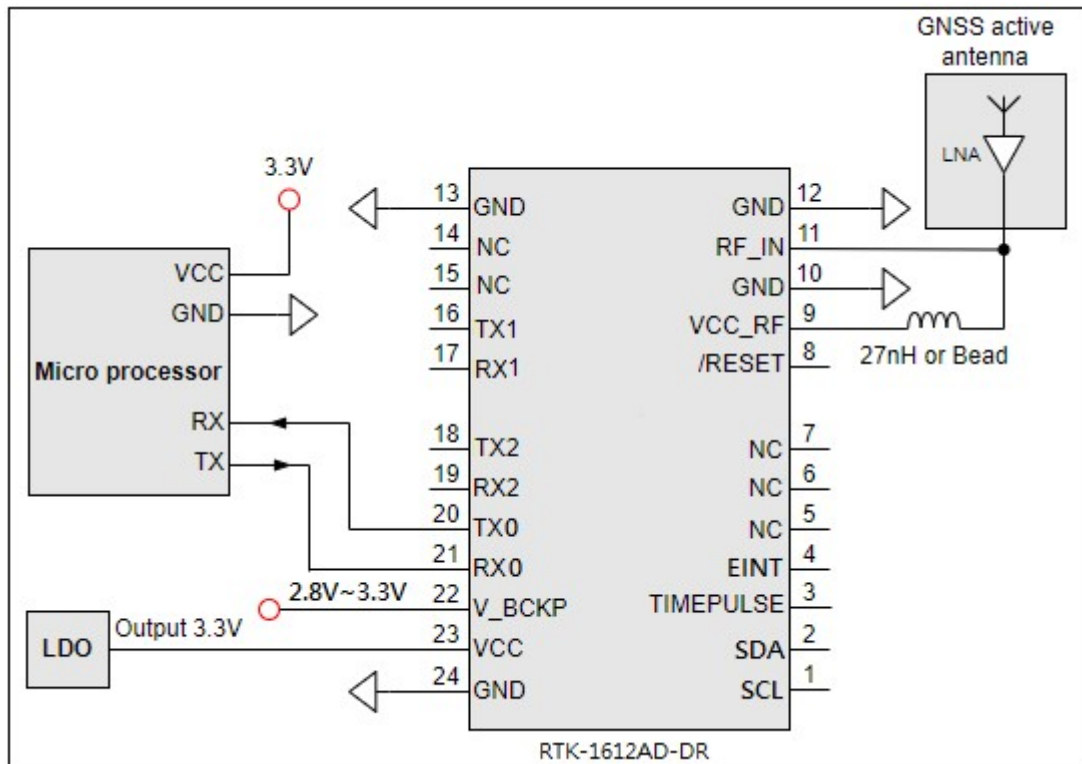


Fig 3-2 Typical application circuit

4 GNSS receiver

Frequency	GPS/QZSS: L1 C/A, L5C GLONASS: L1OF GALILEO: E1, E5a BEIDOU: B1I, B2a	
Channels	Support 135 channels	
Update rate	1Hz default	
Sensitivity	Cold start	-148dBm
	Hot start	-155dBm
	Reacquisition	-158dBm
	Tracking	-165dBm
Acquisition Time	Hot start (Open Sky)	1s (typical)
	Cold Start (Open Sky)	24s (typical)
Position Accuracy	Autonomous	1.5m CEP ⁽¹⁾
	RTK	1cm + 1ppm (horizontal) CEP ⁽¹⁾ 1.5cm + 1ppm (vertical) CEP ⁽¹⁾
	UDR mode	CEP ≤ 3% of distance travelled without GNSS
Max. Altitude	< 18,000 m	
Max. Velocity	< 500 m/s	
Protocol Support	115200 bps ⁽²⁾ , 8 data bits, no parity, 1 stop bits (default)	
	NMEA 0183 ver. 4.1	1Hz: GGA, and RMC
		0.2 Hz: GSA, and GSV
	Proprietary message	1Hz: PAIRMSG
RTCM V3.3	Message type 1005, 1074, 1084, 1094, 1114, 1124	

<Note>

1. 24hr, static, open sky, demonstrated with good dual-frequency active antennas.
2. Both baud rate and output message rate are configurable to be factory default.