

# R12 系列 GNSS 模组规格书

**型号：R12-A1 / R12-E0**

**版本：V1.0**

**修订记录：**

版本	信息	名称	日期
V1.0	初次发行	Jack H	20201218

## 简介

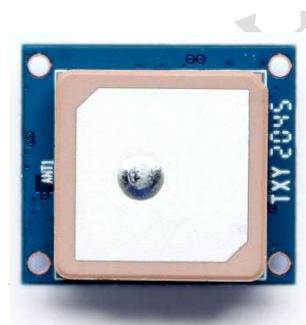
R12 是一款高性能多系统双模定位模组，支持 BDS、GPS、GLONASS、Galileo、QZSS 及 SBAS 等全球导航卫星系统。

R12 为 GNSS 导航应用提供高灵敏度、低功耗、小尺寸的解决方案，易于实现集成无人机、LBS、PND、车辆导航系统等设备中。

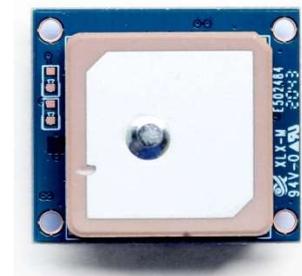
## 特征

- 超高灵敏度 -167dBm
- 小尺寸易于集成
- 内置高增益低噪声放大器
- 高达 18Hz 的更新频率(默认 1Hz)
- 轨道预测，并支持 AGPS
- 支持 NMEA-0183 和 UBX 协议
- 兼容多款地磁
- RF 金属屏蔽罩，以便在噪声环境下到达最佳性能

## 产品图片



R12-A1



R12-E0

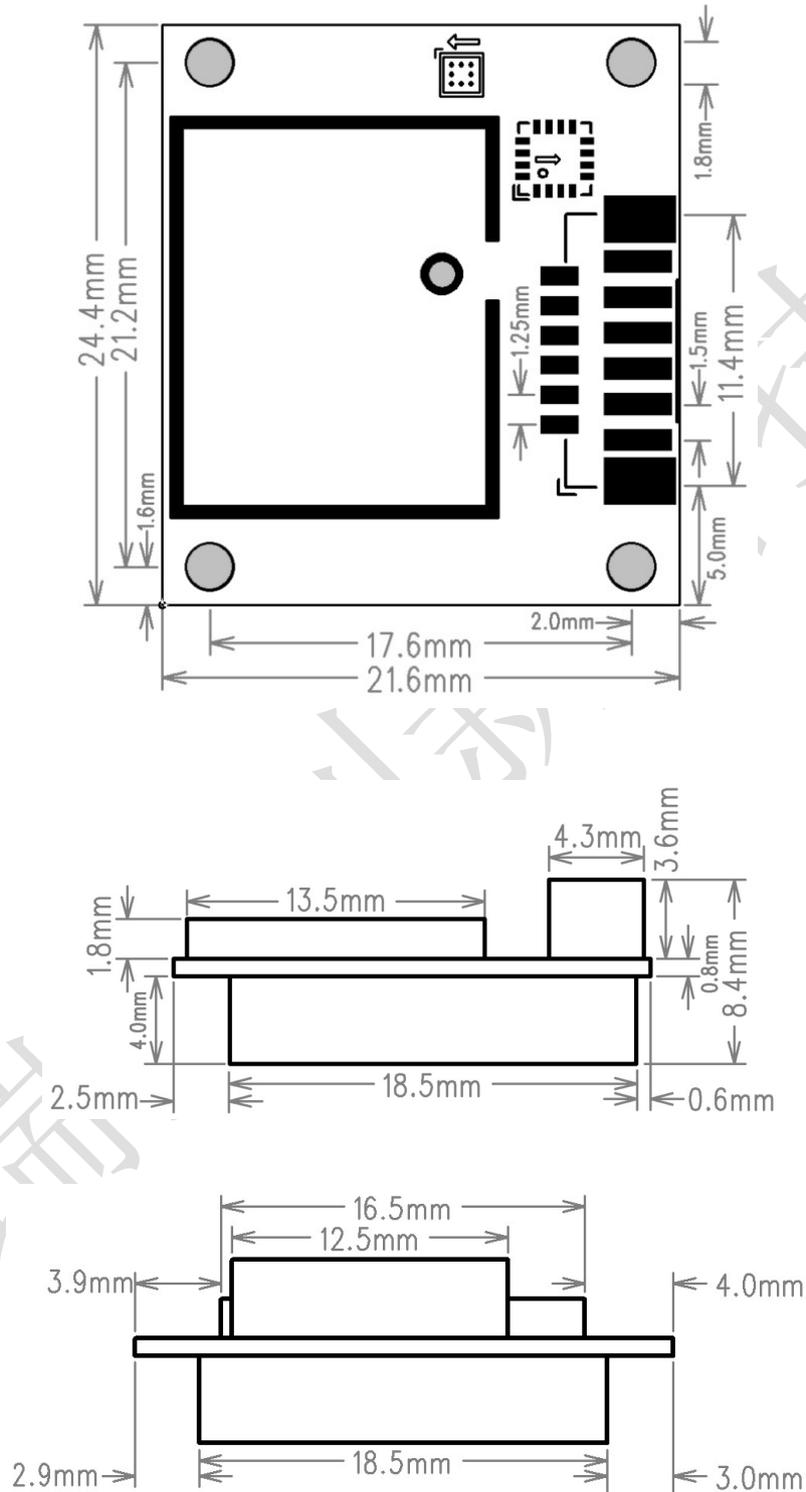
## 产品选型

型号	地磁				指示灯		孔径 (mm)
	QMC5883	MMC3630	ST480MC	QMC6310	正面	反面	
R12-A1	✓	✓	✓		✓		1.5
R12-E0	✓	✓	✓	✓		✓	1.8

## 产品规格

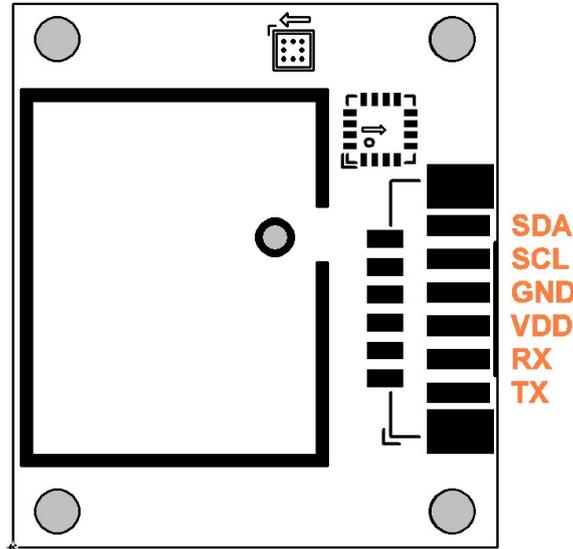
类别	参数	
芯片	内核	72 通道 UBLOX-M8 驱动
	频段	BDS B1, GPS L1C/A, GLONASS L1, GALILEO E1, QZSS L1, SBAS L1
	模式	BDS/GPS/GLONASS/GALILEO 四选二加上辅助卫星 (可根据需要配置)
定位时间	冷启动	26 s
	热启动	1 s
	辅助启动	2 s
灵敏度	跟踪与导航	-167 dBm
	重捕获	-160 dBm
	冷启动	-148 dBm
	热启动	-157 dBm
精度	水平精度	2.5 m
	速度精度	0.05 m/s
	航向精度	0.3 度
输出数据	输出电平	TTL 电平
	波特率	4800 bps ~ 921600 bps, (默认 9600 bps)
	更新频率	1 Hz ~ 18 Hz, (默认 1 Hz)
	输出协议	NMEA-0183 协议、UBX 协议, (默认 NMEA-0183 协议)
操作极限	动态	≤ 4 g
	高度	50,000 m
	速度	500 m/s
工作环境	供电电压	3V ~ 6V, 常规 5V
	工作电流	GPS: 33mA, GPS+BD: 43mA
	操作温度	-40°C ~ +85°C
指示灯	电源灯	电源指示灯, 上电常亮
	PPS 灯	蓝灯, 未定位灯不亮, 3D 定位后开始闪烁

## 机械规格



(注：测量误差±0.2mm)

## 引脚分配



名称	描述
SDA	地磁 I2C 数据线
SCL	地磁 I2C 时钟线
GND	接地
VDD	电源输入 3V~6V, 常规 5V
RX	模组数据接收
TX	模组数据发送

## 配置管理

定位模式				协议		波特率	刷新频率
GPS	GPS	GPS	BD	NMEA	UBX	4800 bps	1 Hz
+	+					~	~
GLONASS	BD					921600 bps	18 Hz
✓	✓	✓	✓	✓	✓	✓	✓

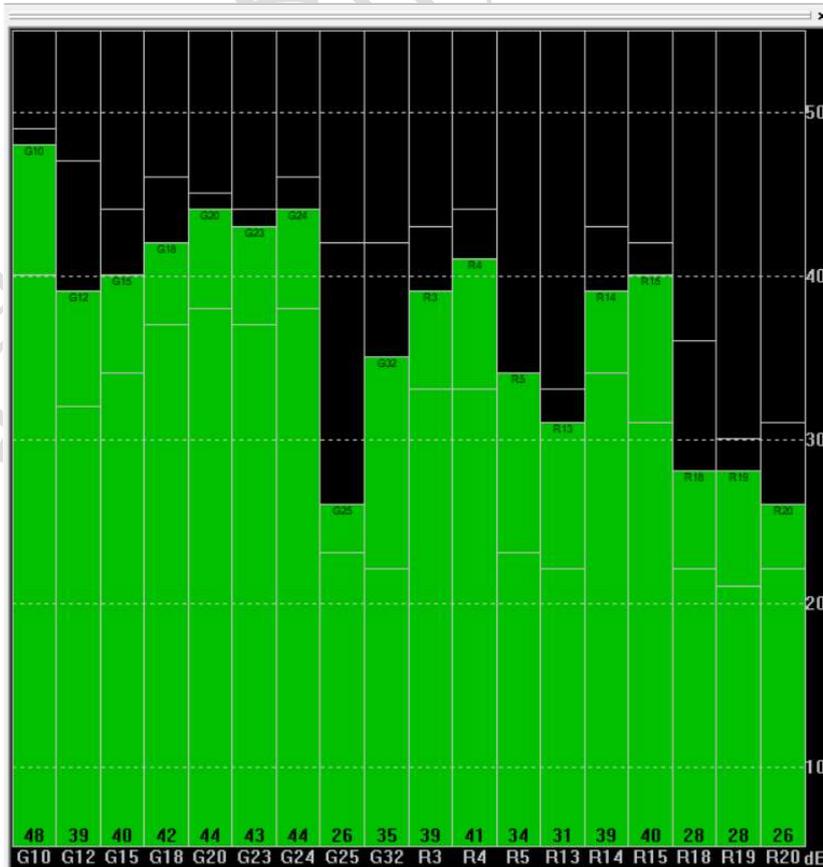
可以通过烧录相应的固件版本来修改配置。

## 实测数据

GPS+GLONASS 双模模式数据输出和信号测试:

```

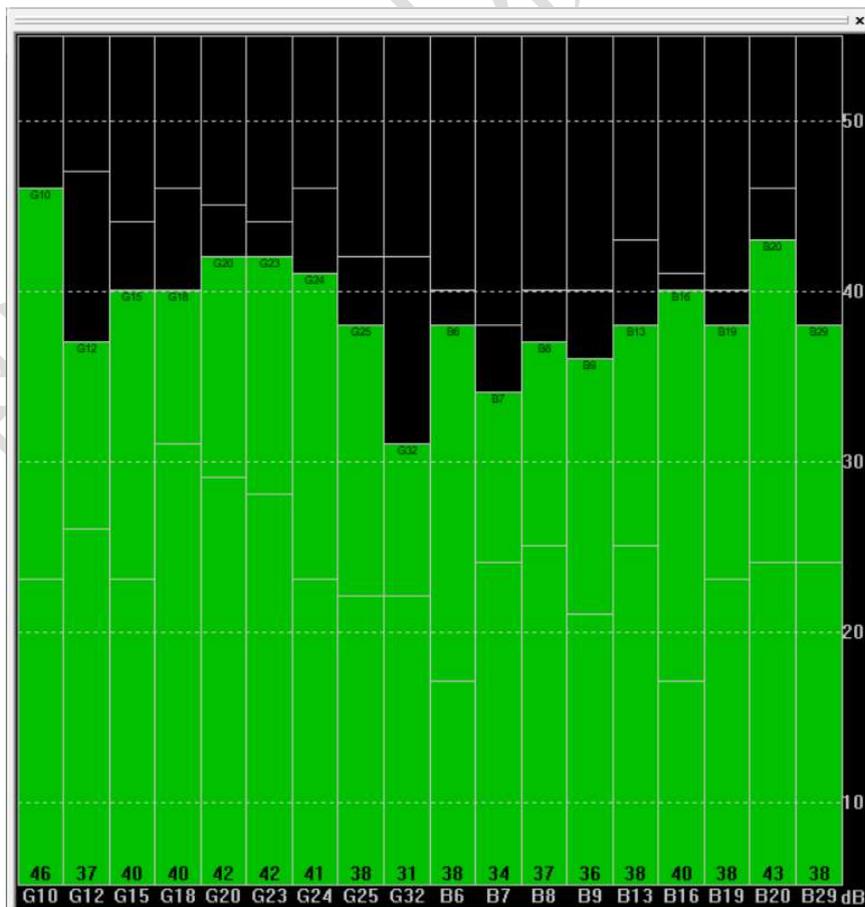
Text Console
03:00:13 $GLGSV,3,3,09,84,14,314,25,0*48
03:00:13 $GNGLL,2234.84392,N,11354.19109,E,030013.00,A,A*77
03:00:14 $GNRMC,030014.00,A,2234.84393,N,11354.19109,E,0.033,,181220,,A,V*1A
03:00:14 $GNVTG,T,M,0.033,N,0.062,K,A*39
03:00:14 $GNNGGA,030014.00,2234.84393,N,11354.19109,E,1,12,0.57,41.2,M,-2.9,M,,1
03:00:14 $GNNSA,M,3,20,23,18,24,10,12,15,32,25,,,,,1.15,0.57,1.00,1*07
03:00:14 $GNNSA,M,3,78,82,67,68,77,79,83,84,69,,,,,1.15,0.57,1.00,2*04
03:00:14 $GPGSV,3,1,10,10,37,330,48,12,26,118,39,15,24,058,39,18,53,206,42,0*6
03:00:14 $GPGSV,3,2,10,20,70,003,44,23,64,005,42,24,47,038,44,25,21,161,26,0*6
03:00:14 $GPGSV,3,3,10,31,03,217,,32,24,284,35,0*6E
03:00:14 $GLGSV,3,1,09,67,30,058,39,68,36,355,42,69,09,309,34,77,26,038,31,0*7
03:00:14 $GLGSV,3,2,09,78,61,105,39,79,31,177,40,82,15,207,29,83,30,254,28,0*7
03:00:14 $GLGSV,3,3,09,84,14,314,25,0*48
03:00:14 $GNGLL,2234.84393,N,11354.19109,E,030014.00,A,A*71
03:00:15 $GNRMC,030015.00,A,2234.84394,N,11354.19110,E,0.015,,181220,,A,V*10
03:00:15 $GNVTG,T,M,0.015,N,0.028,K,A*33
03:00:15 $GNNGGA,030015.00,2234.84394,N,11354.19110,E,1,12,0.57,41.2,M,-2.9,M,,1
03:00:15 $GNNSA,M,3,20,23,18,24,10,12,15,32,25,,,,,1.15,0.57,1.00,1*07
03:00:15 $GNNSA,M,3,78,82,67,68,77,79,83,84,69,,,,,1.15,0.57,1.00,2*04
03:00:15 $GPGSV,3,1,10,10,37,330,48,12,26,118,39,15,24,058,40,18,53,206,42,0*6
03:00:15 $GPGSV,3,2,10,20,70,003,44,23,64,005,42,24,47,038,44,25,21,161,26,0*6
03:00:15 $GPGSV,3,3,10,31,03,217,,32,24,284,35,0*6E
03:00:15 $GLGSV,3,1,09,67,30,058,39,68,36,355,41,69,09,309,34,77,26,038,31,0*7
03:00:15 $GLGSV,3,2,09,78,61,105,39,79,31,177,40,82,15,207,29,83,30,254,28,0*7
03:00:15 $GLGSV,3,3,09,84,14,314,26,0*4B
03:00:15 $GNGLL,2234.84394,N,11354.19110,E,030015.00,A,A*7F
03:00:16 $GNRMC,030016.00,A,2234.84396,N,11354.19111,E,0.019,,181220,,A,V*1C
03:00:16 $GNVTG,T,M,0.019,N,0.035,K,A*33
03:00:16 $GNNGGA,030016.00,2234.84396,N,11354.19111,E,1,12,0.57,41.2,M,-2.9,M,,1
03:00:16 $GNNSA,M,3,20,23,18,24,10,12,15,32,25,,,,,1.15,0.57,1.00,1*07
03:00:16 $GNNSA,M,3,78,82,67,68,77,79,83,84,69,,,,,1.15,0.57,1.00,2*04
03:00:16 $GPGSV,3,1,10,10,37,330,48,12,26,118,39,15,24,058,40,18,53,206,42,0*6
03:00:16 $GPGSV,3,2,10,20,70,003,44,23,64,005,43,24,47,038,44,25,21,161,26,0*6
03:00:16 $GPGSV,3,3,10,31,03,217,,32,24,284,35,0*6E
03:00:16 $GLGSV,3,1,09,67,30,058,39,68,36,355,41,69,09,309,34,77,26,038,31,0*7
03:00:16 $GLGSV,3,2,09,78,61,105,39,79,31,177,40,82,15,207,28,83,30,254,28,0*7
03:00:16 $GLGSV,3,3,09,84,14,314,26,0*4B
03:00:16 $GNGLL,2234.84396,N,11354.19111,E,030016.00,A,A*7F
03:00:17 $GNRMC,030017.00,A,2234.84398,N,11354.19112,E,0.037,,181220,,A,V*1C
03:00:17 $GNVTG,T,M,0.037,N,0.068,K,A*37
03:00:17 $GNNGGA,030017.00,2234.84398,N,11354.19112,E,1,12,0.57,41.3,M,-2.9,M,,1
03:00:17 $GNNSA,M,3,20,23,18,24,10,12,15,32,25,,,,,1.15,0.57,1.00,1*07
03:00:17 $GNNSA,M,3,78,82,67,68,77,79,83,84,69,,,,,1.15,0.57,1.00,2*04
    
```



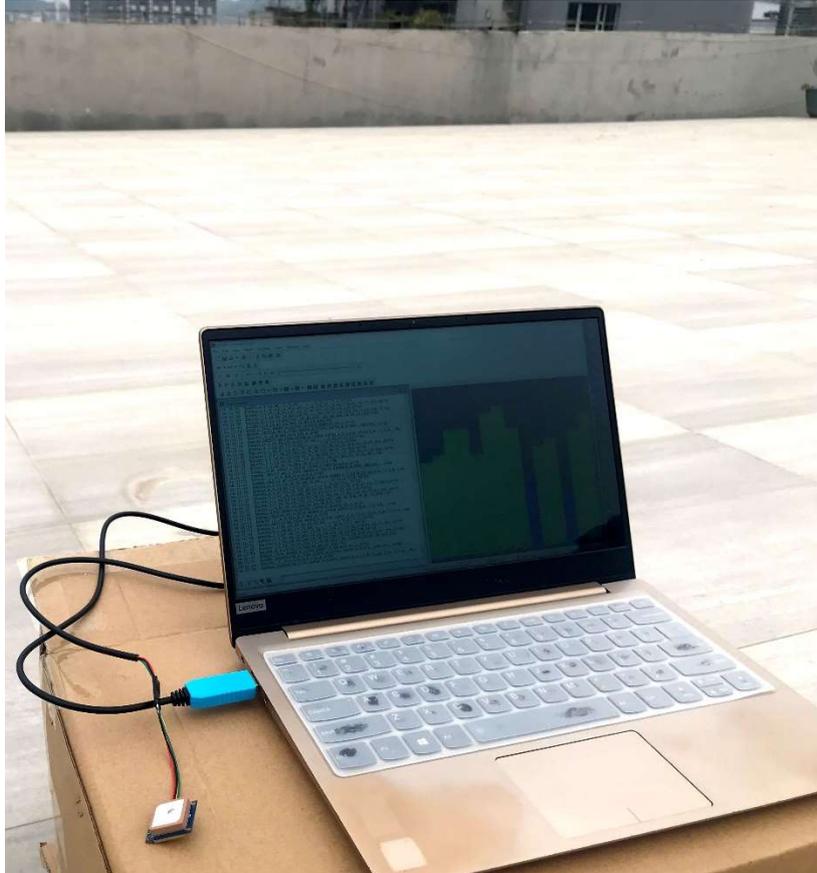
GPS+BD 双模模式数据输出和信号测试:

```

Text Console
02:55:01 $GNRMC,025501.00,A,2234.84549,N,11354.19152,E,0.013,,181220,,A,V*12
02:55:01 $GNVTG,,T,,M,0.013,N,0.023,K,A*3E
02:55:01 $GNGGA,025501.00,2234.84549,N,11354.19152,E,1,12,0.61,38.7,M,-2.9,M,,
02:55:01 $GNGSA,M,3,20,18,23,24,10,15,12,32,25,,,,,1.19,0.61,1.02,1*0C
02:55:01 $GNGSA,M,3,13,03,06,16,09,20,02,01,08,07,29,19,1.19,0.61,1.02,4*01
02:55:01 $GPGSV,3,1,10,10,35,329,45,12,25,121,37,15,25,056,40,18,55,209,41,0*6E
02:55:01 $GPGSV,3,2,10,20,68,360,42,23,62,002,43,24,50,039,41,25,19,162,39,0*6E
02:55:01 $GPGSV,3,3,10,31,01,217,,32,23,282,32,0*6A
02:55:01 $GBGSV,4,1,15,01,46,123,39,02,48,238,37,03,64,189,38,05,25,257,,0*74
02:55:01 $GBGSV,4,2,15,06,59,348,38,07,22,164,34,08,57,183,37,09,53,294,36,0*7E
02:55:01 $GBGSV,4,3,15,10,11,187,,13,70,233,39,16,58,341,40,19,32,323,38,0*7E
02:55:01 $GBGSV,4,4,15,20,54,033,43,29,20,236,38,30,07,186,,0*49
02:55:01 $GNGLL,2234.84549,N,11354.19152,E,025501.00,A,A*7B
02:55:02 $GNRMC,025502.00,A,2234.84549,N,11354.19153,E,0.032,,181220,,A,V*13
02:55:02 $GNVTG,,T,,M,0.032,N,0.060,K,A*3A
02:55:02 $GNGGA,025502.00,2234.84549,N,11354.19153,E,1,12,0.61,38.7,M,-2.9,M,,
02:55:02 $GNGSA,M,3,20,18,23,24,10,15,12,32,25,,,,,1.19,0.61,1.02,1*0C
02:55:02 $GNGSA,M,3,13,03,06,16,09,20,02,01,08,07,29,19,1.19,0.61,1.02,4*01
02:55:02 $GPGSV,3,1,10,10,35,329,43,12,25,121,37,15,25,056,40,18,55,209,40,0*6E
02:55:02 $GPGSV,3,2,10,20,68,360,41,23,62,002,42,24,50,039,41,25,19,162,38,0*6E
02:55:02 $GPGSV,3,3,10,31,01,217,,32,23,282,31,0*69
02:55:02 $GBGSV,4,1,15,01,46,123,39,02,48,238,37,03,64,189,38,05,25,257,,0*74
02:55:02 $GBGSV,4,2,15,06,59,348,38,07,22,164,34,08,57,183,37,09,53,294,36,0*7E
02:55:02 $GBGSV,4,3,15,10,11,187,,13,70,233,38,16,58,341,40,19,32,323,38,0*7F
02:55:02 $GBGSV,4,4,15,20,54,033,43,29,20,236,38,30,07,186,,0*49
02:55:02 $GNGLL,2234.84549,N,11354.19153,E,025502.00,A,A*79
02:55:03 $GNRMC,025503.00,A,2234.84549,N,11354.19154,E,0.018,,181220,,A,V*1D
02:55:03 $GNVTG,,T,,M,0.018,N,0.034,K,A*33
02:55:03 $GNGGA,025503.00,2234.84549,N,11354.19154,E,1,12,0.61,38.7,M,-2.9,M,,
02:55:03 $GNGSA,M,3,20,18,23,24,10,15,12,32,25,,,,,1.19,0.61,1.02,1*0C
02:55:03 $GNGSA,M,3,13,03,06,16,09,20,02,01,08,07,29,19,1.19,0.61,1.02,4*01
02:55:03 $GPGSV,3,1,10,10,35,329,46,12,25,121,37,15,25,056,40,18,55,209,40,0*6E
02:55:03 $GPGSV,3,2,10,20,68,360,42,23,62,002,42,24,50,039,41,25,19,162,38,0*6E
02:55:03 $GPGSV,3,3,10,31,01,217,,32,23,282,31,0*69
02:55:03 $GBGSV,4,1,15,01,46,123,39,02,48,238,37,03,64,189,38,05,25,257,,0*74
02:55:03 $GBGSV,4,2,15,06,59,348,38,07,22,164,34,08,57,183,37,09,53,294,36,0*7E
02:55:03 $GBGSV,4,3,15,10,11,187,,13,70,233,38,16,58,341,40,19,32,323,38,0*7F
02:55:03 $GBGSV,4,4,15,20,54,033,43,29,20,236,38,30,07,186,,0*49
02:55:03 $GNGLL,2234.84549,N,11354.19154,E,025503.00,A,A*7F
02:55:04 $GNRMC,025504.00,A,2234.84549,N,11354.19155,E,0.039,,181220,,A,V*18
02:55:04 $GNVTG,,T,,M,0.039,N,0.072,K,A*32
02:55:04 $GNGGA,025504.00,2234.84549,N,11354.19155,E,1,12,0.61,38.7,M,-2.9,M,,
02:55:04 $GNGSA,M,3,20,18,23,24,10,15,12,32,25,,,,,1.19,0.61,1.02,1*0C
    
```



实测环境：（楼顶天台）



联系我们

**深圳市瑞杰创新科技有限公司**

**Extreme Power Technology Co., Limited**

地址：广东省深圳市宝安区新安街道新安三路 118 号建达工业区 1 栋 517-519

电话：0755-23502189

邮箱：vince@eppinno.com

网址：[www.eppinno.com](http://www.eppinno.com)