



GNSS Receivers

Provides accurate positioning of satellites and aircraft

The GR series universal signal processing platform possesses the characteristics of standardized product interfaces and modular designs, enabling it to cater to the development requirements of diverse spacecraft platforms over the next 10 to 15 years. It is capable of fulfilling the application demands for "longevity and high reliability" in satellites, boasting a reliability rate of 0.997. Furthermore, it can consistently and reliably deliver precise positioning and orbit determination, real-time high-precision positioning, high-accuracy timing, as well as other functionalities to space vehicles.

Key features

Mass products flight proven

High reliability

Cost-effective

Support multiple navigation systems

Low power consumption, small size



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GR01

Operating frequency and bandwidth	GPS L1 : 1575.42±1.023MHz
	GLONASS L1 : 1227.6±10.23MHz
	BDS B1I : 1561.098±2.046MHz
	BDS B1C : 1575.42±10.23MHz
	GALILEO E1 : 1575.42±10.23MHz
Channel number	Every frequency channel ≥ 12
Acquisition Sensitivity	better -176dBW(receiver entrance)
Tracking sensitivity	better -179dBW(receiver entrance)
Raw observation accuracy	Initial orbit/transition orbit : Pseudo-distance : better than 1m (1σ); Carrier phase : better than 1cm (1σ)
	Final orbit: Pseudo-distance : better than 10m (1σ); Carrier phase : better than 3cm (1σ)
Real-time positioning accuracy (DOP ≤ 100)	Position accuracy : ≤ 100m (triaxial 1σ) @5 0000 km, Velocity accuracy : ≤ 0.2m/s (triaxial 1σ)@5 0000 km
Real-time orbit determination accuracy (DOP ≤ 100)	Velocity accuracy : ≤ 20m (Velocity accuracy 1σ) @50000 k'm, Velocity accuracy : ≤ 0.1m/s (Velocity accuracy 1σ)@50000km
Orbit determination extrapolation accuracy	Velocity accuracy : ≤ 100m (Velocity accuracy 1σ), Velocity accuracy : ≤ 0.5m/s (Velocity accuracy 1σ)
Time accuracy	better than 1μs
Data update rate	1s
Cold start time	≤ 10min
In-orbit operation life	≥ 8 years
Radiation resistance	Anti-irradiation total dose requirements for components with 4mm equivalent aluminum shielding within the satellite ≥ 100Krad(Si)



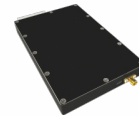
GR03

Operating frequency and bandwidth	GPS L1 : 1575.42±10MHz
	GPS L2P : 1227.6±10MHz
	BDS B1I : 1561.098±2.046MHz
	BDS B3I : 1561.098±10.23MHz
Channel number	Every frequency channel ≥ 12
Acquisition Sensitivity	L2P better -162dBW (receiver entrance)
	Other frequencies are superior -156dBW (receiver entrance)
Code pseudo-distance measurement accuracy	<0.3m (1σ, Observe the load to noise ratio ≥ 41dB-Hz) Measurement data sampling frequency : 1Hz
Carrier phase measurement accuracy	< 2% round (1σ, Observe the load to noise ratio ≥ 41dB-Hz, Equivalent distance approximation 4 mm) The sampling frequency of measurement data : 1Hz
Output position and speed in orbit	Position accuracy 10 meters (1σ), Velocity accuracy 2cm/s (1σ)
Timing accuracy	≤ 30ns (1σ)



GR02

Operating frequency and bandwidth	GPS L1 : 1575.42±1.023MHz BDS B1I : 1561.098±2.046MHz
Channel number	Every frequency channel ≥ 12
System receiving sensitivity	Acquisition sensitivity -162dBW (receiver entrance)
Dynamic range of the received signal	≥ 25dB
Dynamic characteristic	speed : 0 km/s~10km/s , acceleration : 0 g~6g, acceleration : 0 g/s~2g/s
Acquisition positioning time	Cold start (blind catch) first positioning time : ≤ 180s, Instantaneous loss of lock within 20s, ≤ 3s, Instantaneous loss of lock within 20s
Single point positioning accuracy (3σ)	Positioning accuracy : better than 10m(single axis), speed accuracy : better than 0.1m/s(single axis)
Orbit determination accuracy	Position accuracy : better than 4m (single axis, 1σ), speed accuracy : better than 0.01m/s (single axis, 1σ)
Precision of mean orbital roots	Accuracy : better than 10m (single axis)
Time accuracy	Second pulse timing signal : ≤ 1μs
Frequency of data output	Time information data : 1Hz, Second pulse timing signal : 1Hz
Reliability	≥ 0.98



GR04

Operating frequency and bandwidth	GPS L1 : 1575.42±1.023MHz BDS B1I : 1561.098±2.046MHz
Channel number	Every frequency channel ≥ 12
Acquisition Sensitivity	better than -160dBW (GNSS Front low noise input)
Tracking sensitivity	better than -162dBW (GNSS Front low noise input)
Real-time orbit determination accuracy	Position accuracy : ≤ 4m (single axis, 1σ)
	Velocity accuracy : ≤ 0.01m/s (single axis, 1σ) The number of non-location occurrences in more than 30 minutes ≤ 2 times/ month
GNSS L Band original observation accuracy	pseudo-range : better 0.3m (triaxial 1σ), Velocity accuracy : better 2mm (triaxial 1σ)
PPS accuracy	better than 50ns
	Ability to receive external PPS
Orbit determination extrapolation accuracy	Extrapolation 30 minutes, position accuracy : <50m
	Extrapolation 60 minutes, position accuracy : <100m
	8 hours of extrapolation, position accuracy : ≤ 1Km 12 hours of extrapolation, position accuracy : ≤ 2Km
Orbit determination output frequency	1Hz
Cold start time	≤ 10min
Radiation resistance	Anti-irradiation total dose requirements for components with 4mm equivalent aluminum shielding within the satellite ≥ 100Krad(Si)

