LOCOSYS

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AeroStar X1 Specification

1. Product Overview

The AeroStar X1 antenna by LOCOSYS Technology Inc. is capable of simultaneously receiving signals from GPS L1/L2/L5, GLONASS G1/G2, and BeiDou B1/B2/B3 frequency bands. It is fully compatible with mainstream GNSS/RTK boards and modules both domestically and internationally. Utilizing high-precision triple-frequency positioning, it is plug-and-play ready and easily achieves sub-meter accuracy. When integrated with ground-based augmentation systems (SBAS), it supports RTK functionality to provide centimeter- to millimeter-level positioning precision.

Developed and rigorously tested by LOCOSYS Technology Inc., a leading provider of GNSS and positioning solutions based in Taiwan, the AeroStar X1 benefits from decades of expertise in satellite navigation, RF circuit design, and high-frequency antenna engineering. LOCOSYS is renowned for its strong R&D capabilities and has delivered GNSS modules, antennas, and integrated solutions to global markets across Europe, North America, and Asia. By combining in-house hardware development with firmware and algorithm innovation, LOCOSYS ensures optimal signal quality and stability, even in the most challenging environments.

This antenna is widely applicable in aerospace, precision agriculture, vehicular positioning, autonomous navigation, and surveying applications that require stable and accurate GNSS data. As the demand for precise positioning continues to grow across industries, antennas like the AeroStar X1 play a crucial role in enabling next-generation applications such as:

- **Unmanned Aerial/Ground/Marine Vehicles (UAV/AGV/UGV)**
  High-reliability GNSS reception is essential for flight control, autonomous navigation, and aerial mapping. The antenna's wide-beam coverage and minimal phase center variation make it an ideal choice for UAVs or mobile platforms.

- **Smart Agriculture and Agricultural Machinery**
  When integrated with GNSS RTK solutions, farmers can achieve centimeter-level accuracy in planting, spraying, and harvesting, greatly improving efficiency and productivity.

- **Autonomous Vehicles and ADAS**
  The combination of L1/L2/L5 signals enhances multipath resistance and positioning robustness in urban and semi-obstructed environments—key to the safety of autonomous driving systems.

- **Land Surveying, Infrastructure Monitoring (e.g., dams, bridges, landslides)**
  High-precision antennas are indispensable for collecting reliable and repeatable geospatial data in topographic surveys and GIS applications.

- **Timing and Infrastructure Synchronization**
  In telecommunications, power grids, and LEO satellite systems, accurate GNSS timing provided by such antennas is critical for network stability and fault diagnostics.

By leveraging high zenith gain, wide-angle circular polarization, and millimeter-level phase center stability, LOCOSYS ensures uncompromised performance even in GNSS-challenging conditions such as urban canyons, forested regions, or obstructed terrains. As autonomous systems and IoT deployments continue to evolve, LOCOSYS remains committed to delivering scalable, rugged, and high-performance GNSS antenna solutions to meet the growing demand for reliable, real-time, and multi-band precision positioning.

2. Features

- **High Zenith Gain & Wide Beamwidth**
  The antenna provides high gain at the zenith and features a wide-beam radiation pattern with wide-angle circular polarization. These characteristics ensure excellent reception of low-elevation signals, allowing reliable satellite tracking even in partially obstructed environments.
- **Multi-feed Point Design**
  A multi-feed point architecture ensures the phase center aligns closely with the geometric center of the antenna, minimizing measurement errors. The phase center variation (PCV) is controlled within millimeter-level tolerances.
- **Advanced ESD & Surge Protection**
  The antenna incorporates a proprietary electrostatic discharge (ESD) and lightning protection circuit with over-voltage protection. A high-performance out-of-band

filter is integrated to ensure robust operation even under harsh electromagnetic interference (EMI) conditions.

- **Ruggedized Mechanical Design**
  The radome is constructed from UV-resistant, high-strength ABS material with an IP67 waterproof rating. The base is made of titanium-aluminum alloy, significantly reducing overall antenna weight without compromising structural integrity.

- **Low Noise Amplifier (LNA) Design**
  The antenna's LNA employs a dual-stage filtering scheme. Incoming signals are first filtered to suppress out-of-band interference and then amplified. This design minimizes the risk of amplifier saturation and enhances the overall reliability of the GNSS system.

3. Electrical Specification:

3.1 Antenna

Frequency Range	GPS L1:1575MHz/L2:1227MHz/L5:1176MHz BeiDou B1:1561MHz/B2:1207MHz/B3:1268MHz GLONASS G1:1602MHz/G2:12446MHz GALILEO E1:11575MHz/E5b:1207MHz
Zenith Gain	L1≧3.5dBi B1≧3.5dBi G1≧3.0dBi E1≧2.0dBi L2≧3.0dBi B2≧2.5dBi G2≧3.0dBi E5b≧2.0dBi B3≧3.0dBi
Polarization	RHCP
Output VSWR	< 1.5
Output Impedance	50Ω
Horizontal Beamwidth	360°
Low-Elevation Axial Ratio Deviation	±2dB (Elevation≧20°)
Zenith Axial Ratio	≦3dB
Phase Center Offset (PCO)	≦3mm

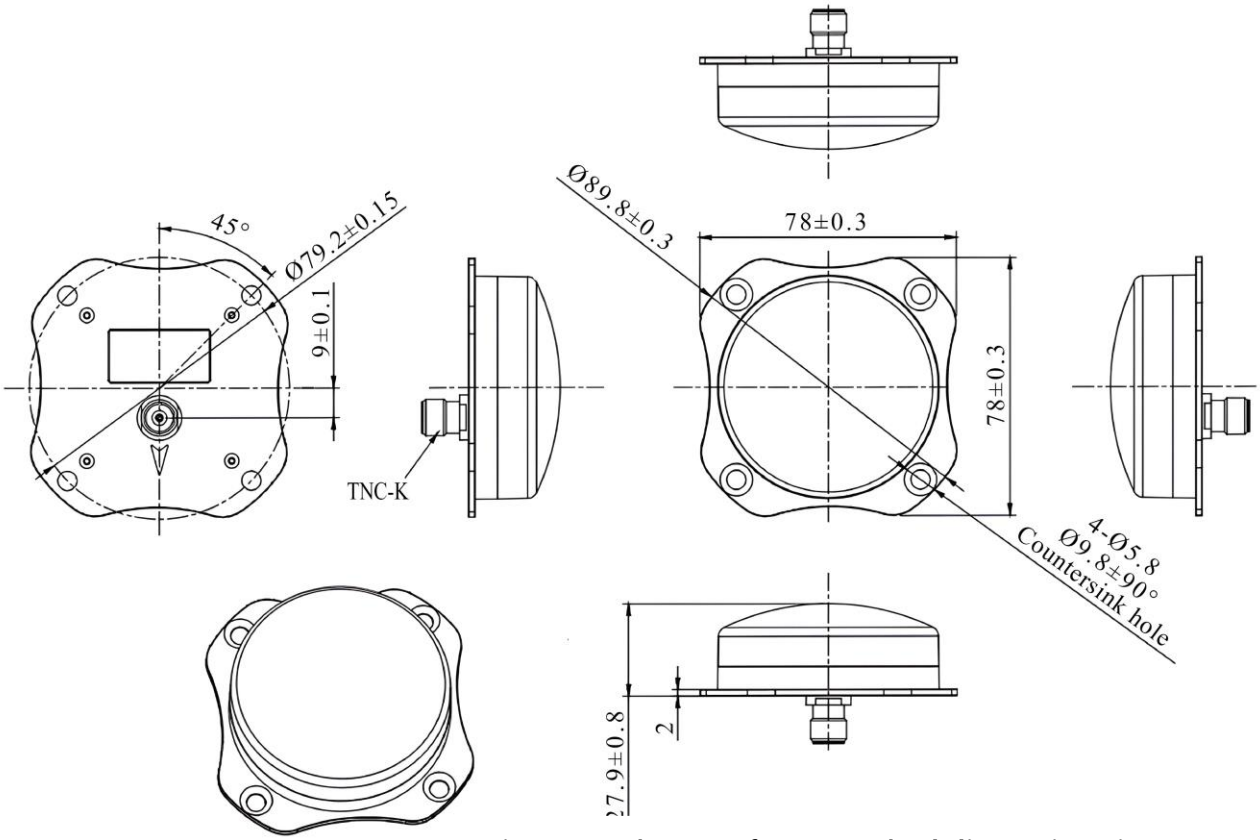
3.2 LNA

Gain	38.0±2.0dB
Noise Figure	≦2.0dB
Intput V.S.W.R	＜2.0
Output V.S.W.R	＜2.0
Output impedance	50Ω
Voltage	3.3V-6V
Current	≦150mA

3.3 Mechanical Specifications

Size	78mm*78mm*28mm
Connector type	TNC-K
Mounting	4 Ø5.6mm positioning holes, hole spacing 56mm for mechanical installation
Weight	< 150g
Waterproof	IP67
Material	ASA

4. Product Size



Unit: mm, tolerance for unmarked dimensions is ±0.3mm