

GNSS Antenna

Type **AU-500**

Hardware Specifications

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Revision History

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0	Initial release	2023.09.29
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1 Outlines

This document describes the specifications of the GNSS antenna AU-500.

AU-500 is a GNSS antenna unit that amplifies signals received from L1 band and L5 band GNSS satellites and outputs them to a GNSS receiver.

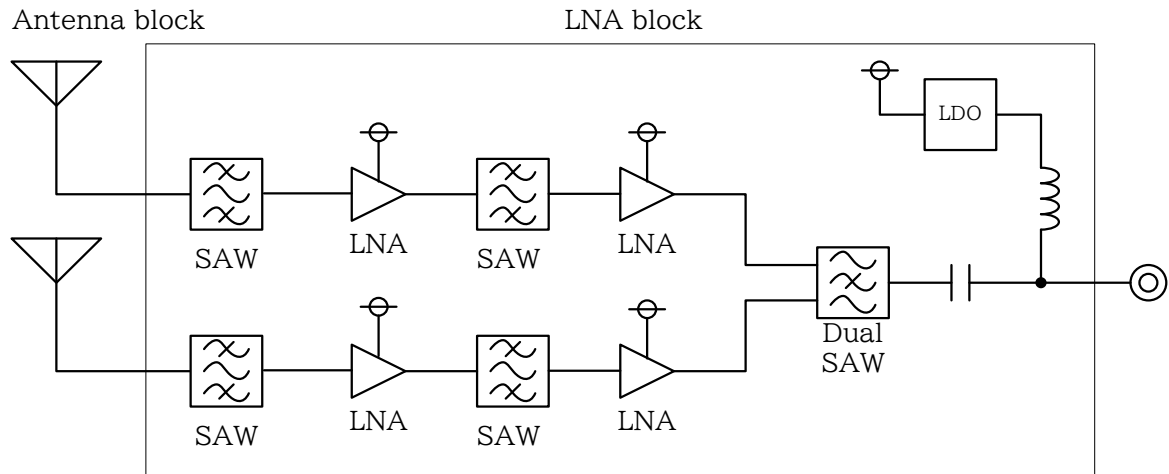


Figure 1.1 Block diagram

2 Hardware Specifications

2.1 Electrical Specifications

2.1.1 Antenna block

Item	Specification	Notes
Receive polarization	Right Hand Circularly Polarization	
Absolute gain	$\geq 4.0\text{dBi}$ (Peak gain) $\geq 2.0\text{dBi}$ (In-band)	
Bandwidth	L1 band	1558 to 1606MHz
	L5 band	1164 to 1189MHz
Axial Ratio	$\leq 4.0\text{dB}$ (within bandwidth, Elevation angle 90°)	

2.1.2 LNA block

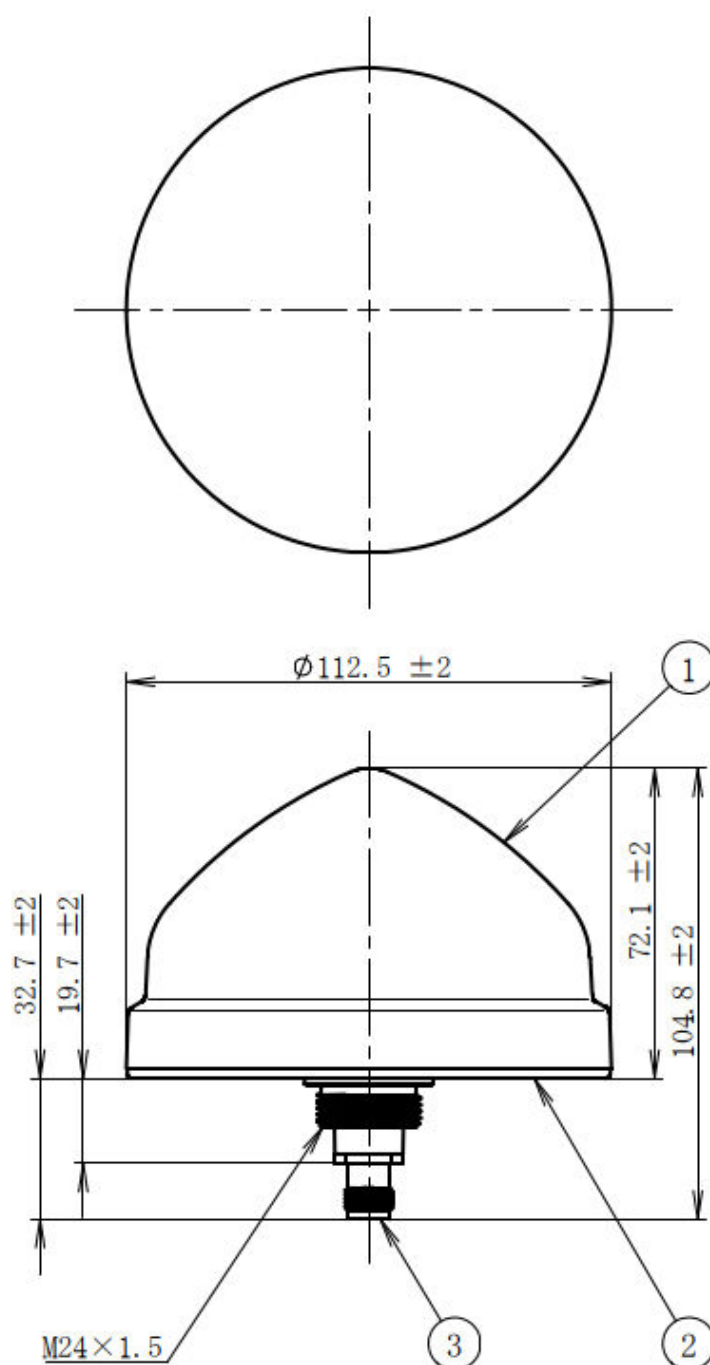
Item	Specification	Notes
Gain	$40\pm 3\text{dB}$	
NF	$\leq 2.5\text{dB}$	
Passband	L1 band	$f_0=1582\text{MHz}$
	L5 band	$f_0=1176.5\text{MHz}$
Out-of-band attenuation	$\leq -50\text{dB}$	$f_0\pm 50\text{MHz}$
	$\leq -70\text{dB}$	$f_0\pm 100\text{MHz}$
Rated input level	$\leq -45\text{dBm}$	$\leq f_0\pm 50\text{MHz}$
	$\leq +5\text{dBm}$	$\geq f_0\pm 50\text{MHz}$
Group delay	L1 band	80ns typ @1558MHz
		51ns typ @1575.42MHz
		70ns typ @1606MHz
	L5 band	55ns typ @1164MHz
		50ns typ @1176.45MHz
		57ns typ @1189MHz
VSWR	≤ 2.0	
Impedance	50Ω	
Supply Voltage range	2.5 to 12V	
Absolute maximum ratings	14.4V	
Current consumption	30mA or less	

* Items without specific instructions are specified at room temperature: $+20^\circ\text{C}$, normal humidity: $60\pm 20\text{RH}$, supply voltage range 2.5 to 12V.

2.2 Mechanical Specifications, Environmental specifications

Item	Specification	Notes
External dimension	$\phi 112.5 \times H104.8 \text{mm}$	
Weight	$340 \pm 17 \text{g}$	
Connector type	TNC-J	
Operating temperature	-40 to +85°C	
Operating humidity	20 to 90%RH	Relative humidity
Storage temperature	-40 to +85°C	
Storage humidity	20 to 90%RH	Relative humidity
Lightning surge protection	$\pm 4 \text{kV}$	IEC61000-4-5
Anti-static electricity	$\pm 15 \text{kV}$	Air discharge. IEC61000-4-2
Dustproof/waterproof	IP67	Only if the connector part is drip proofed.

3 Outline Drawing



TNC recommended torque: 0.46 to 0.69 N·m

No.	Parts name	Number	Material	Process
1	Radome	1	Polycarbonate	-
2	Base	1	Aluminum die cast	Powder painting
3	TNC Connector	1	Brass	Nickel plating

Figure 3.1 Outer diameter drawing

4 Reliability Test

No	Test item	Test condition	Judgment criteria
1	High temperature storage	Temperature: +85°C Duration: 96 hours	After being left at room temperature and humidity for 2 hours, the product shall satisfy the function and performance and there should be no abnormality in appearance.
2	Low temperature storage	Temperature: -40°C Duration: 96 hours	After being left at room temperature and humidity for 2 hours, the product shall satisfy the function and performance and there should be no abnormality in appearance.
3	High temperature operation	Temperature: +85°C Duration: 96 hours *Max supply voltage	After being left at room temperature and humidity for 2 hours, the product shall satisfy the function and performance and there should be no abnormality in appearance.
4	Low temperature operation	Temperature: -40°C Duration: 96 hours *Max supply voltage	After being left at room temperature and humidity for 2 hours, the product shall satisfy the function and performance and there should be no abnormality in appearance.
5	High temperature and High humidity storage	Temperature: +60°C Humidity: 90% Duration: 96 hours	After being left at room temperature and humidity for 2 hours, the product shall satisfy the function and performance and there should be no abnormality in appearance.
6	Thermal shock test	-40°C (30 min), +85°C (30min) Transfer time : <5mins 200 cycles	After being left at room temperature and humidity for 2 hours, the product shall satisfy the function and performance and there should be no abnormality in appearance.
7	Waterproof test	IP67	After the test, there should be no ingress of water or dust into the casing, and the performance should be satisfied.
8	Vibration test	15 mins at 3Gs, 10-200Hz, Sweep time is 15mins per sweep. (7.5 mins up/ 7.5mins) 2 hours of Random Vibration in all three axes (X, Y and Z) MIL STD 810D, Trans common carrier (restrained)	There shall be no deformation, damage, or loose screws on the product. There should be no misalignment or detachment of the fitting part. Satisfy the electrical performance.
9	Shock test	50G, 11msc. Vertical Axis, all other axes 30G (X and Y)	There shall be no deformation, damage, or loose screws on the product. There should be no misalignment or detachment of the fitting part. Satisfy the electrical performance.
10	Drop test	Drop Height: 50cm x 3times x 2faces (TOP & Bottom)	There shall be no abnormality in function or structure after the test. Satisfy the electrical performance.

5 Failure Rate

Item	Condition	
environmental temperature	25°C	85°C
Failure rate [FIT]	11180	13939
MTBF [Hour]	89445	71739
MTBF [Year]	10.2	8.2

6 Notices



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.

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



This device meets the requirements of the following standards and directives:

EMC Directive: 2014/30/EU

EN 301 489-1:2019 , EN 301 489-19:2022

Radio equipment Directive: 2014/53/EU

EN 303 413:2021

Low voltage Directive: 2014/35/EU

EN 62368-1

RoHS Directive: 2011/65/EU

WEEE Directive: 2012/19/EU