



SPIDER'S ANTENNAS (ORG18-4T GNSS) ANTENNA ELEMENT

Datasheet

OriginGPS.com



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1. SCOPE

This document describes the features and specifications of Spider's Antennas ORG18-4T GNSS Antenna.

2. DISCLAIMER

All trademarks are properties of their respective owners.

Performance characteristics listed in this document do not constitute a warranty or guarantee of product performance. OriginGPS assumes no liability or responsibility for any claims or damages arising out of the use of this document, or from the use of integrated circuits based on this document.

OriginGPS assumes no liability or responsibility for unintentional inaccuracies or omissions in this document.

OriginGPS reserves the right to make changes in its products, specifications and other information at any time without notice.

OriginGPS reserves the right to conduct, from time to time, and at its sole discretion, firmware upgrades.

As long as those FW improvements have no material change on end customers, PCN may not be issued.

OriginGPS navigation products are not recommended to use in life saving or life sustaining applications.



3. SAFETY INFORMATION

Improper handling and use can cause permanent damage to the product.

4. ESD SENSITIVITY

This product is ESD sensitive device and must be handled with care.



5. CONTACT INFORMATION

Support - info@origingps.com or [Online Form](#)

Marketing and sales - marketing@origingps.com

Web – www.origingps.com

6. RELATED DOCUMENTATION

No	DOCUMENT NAME
1	Micro Spider – ORG4475 Evaluation Kit Datasheet
2	Micro Spider – ORG4475 Product Change Notification
3	Spider and Hornet - Software User Manual for CSR® based receivers
4	Spider and Hornet - NMEA Protocol Reference Manual for CSR® based receivers
5	Spider and Hornet - One Socket Protocol Reference Manual for CSR® based receivers
6	Spider and Hornet - Host Interface Application Note
7	Spider and Hornet - Low Power Modes Application Note
8	Spider and Hornet - Jammer Detector and Remover Application Note
9	Spider and Hornet - Client Generated Extended Ephemeris Application Note
10	Spider and Hornet - Server Generated Extended Ephemeris Application Note
11	Spider and Hornet - Ephemeris Push Application Note

TABLE 1 – RELATED DOCUMENTATION

7. REVISION HISTORY

REVISION	DATE	CHANGE DESCRIPTION
A00	December 1, 2011	First release
2.0	January 14, 2015	Format update
3.0	March 15, 2015	Updated GNSS Support
4.0	August 10, 2015	Updated GNSS data and S11

TABLE 2 – REVISION HISTORY



8. GLOSSARY

A-GNSS Assisted **GNSS**
BPF Band Pass Filter
CE European Community conformity mark
CGEE™ Client Generated Extended Ephemeris
CMOS Complementary Metal-Oxide Semiconductor
COMPASS PRC GNSS (same as **BDS BeiDou-2** Navigation Satellite System)
EGNOS European Geostationary Navigation Overlay Service
EMC Electro-Magnetic Compatibility
ESD Electro-Static Discharge
EVB Evaluation Board
EVK Evaluation Kit
FCC Federal Communications Commission
GALILEO EU GNSS
GLONASS Global Navigation Satellite System
GNSS Global Navigation Satellite System
GPS Global Positioning System
I²C Inter-Integrated Circuit
IC Integrated Circuit
ISO International Organization for Standardization
LDO Low Dropout regulator
LGA Land Grid Array
LNA Low Noise Amplifier
MSAS Multi-functional Satellite Augmentation System
MSL Moisture Sensitivity Level
NFZ™ Noise-Free Zones System
NMEA National Marine Electronics Association
MEMS MicroElectroMechanical Systems
PCB Printed Circuit Board
PPS Pulse Per Second
QZSS Quasi-Zenith Satellite System
REACH Registration, Evaluation, Authorisation and Restriction of Chemical substances
RF Radio Frequency
RHCP Right-Hand Circular Polarized
RoHS Restriction of Hazardous Substances directive
ROM Read-Only Memory
RTC Real-Time Clock
SAW Surface Acoustic Wave
SBAS Satellite-Based Augmentation Systems
SGEE™ Server Generated Extended Ephemeris
SIP System In Package
SMD Surface Mounted Device
SMT Surface-Mount Technology
SOC System On Chip
SPI Serial Peripheral Interface
TCXO Temperature-Compensated Crystal Oscillator
TTF Time To First Fix
TTL Transistor-Transistor Logic
UART Universal Asynchronous Receiver/Transmitter
WAAS Wide Area Augmentation System



9. ABOUT SPIDER FAMILY

OriginGPS GNSS receiver modules have been designed to address markets where size, weight, stand-alone operation, highest level of integration, power consumption and design flexibility - all are very important.

OriginGPS' Spider family breaks size barrier, offering the industry's smallest fully-integrated, highly-sensitive GPS and GNSS modules.

Spider family features OriginGPS' proprietary NFZ™ technology for high sensitivity and noise immunity even under marginal signal condition, commonly found in urban canyons, under dense foliage or when the receiver's position in space rapidly changes.

Spider family enables the shortest TTM (Time-To-Market) with minimal design risks.

Just connect an antenna and power supply on a 2-layer PCB.

10. ABOUT SPIDER'S ANTENNAS

L1 Ceramic Patch Antennas – For ultimate compatibility and best-in-class performance use our Spider's modules together with Spider's Antennas.

11. ABOUT ORIGINGPS

OriginGPS is a world leading designer, manufacturer and supplier of miniature positioning modules, antenna modules and antenna solutions.

OriginGPS modules introduce unparalleled sensitivity and noise immunity by incorporating Noise Free Zone system (NFZ™) proprietary technology for faster position fix and navigation stability even under challenging satellite signal conditions.

Founded in 2006, OriginGPS is specializing in development of unique technologies that miniaturize RF Modules, thereby addressing the market need for smaller wireless solutions.



12. SPECIFICATIONS

12.1. ELECTRICAL CHARACTERISTICS

Parameter		Value	Unit	Notes
Frequency		1575.42-1612	MHz	18mm x 18mm GP
Return Loss (S11)		10 (min)	dB	@fC
Bandwidth (BW)		11 (min)	MHz	@ f(S11=-9dB)
VSWR		1.5 (max)		
Impedance (ZA)		50	Ω	
Axial Ratio (AR)		GPS- Typ. 18.5 GLO- Typ. 15	dB	
Gain @ fC	@ zenith	GPS- Typ. -3.5 GLO- Typ. -4	dBic	18mm x 18mm GP
Polarization		R.H.C.P		
Temperature Factor (tF)		0 $\pm$ 20	ppm/°C	-40°C to +85°C

TABLE 3 – ELECTRICAL CHARACTERISTICS

12.2. TYPICAL S11

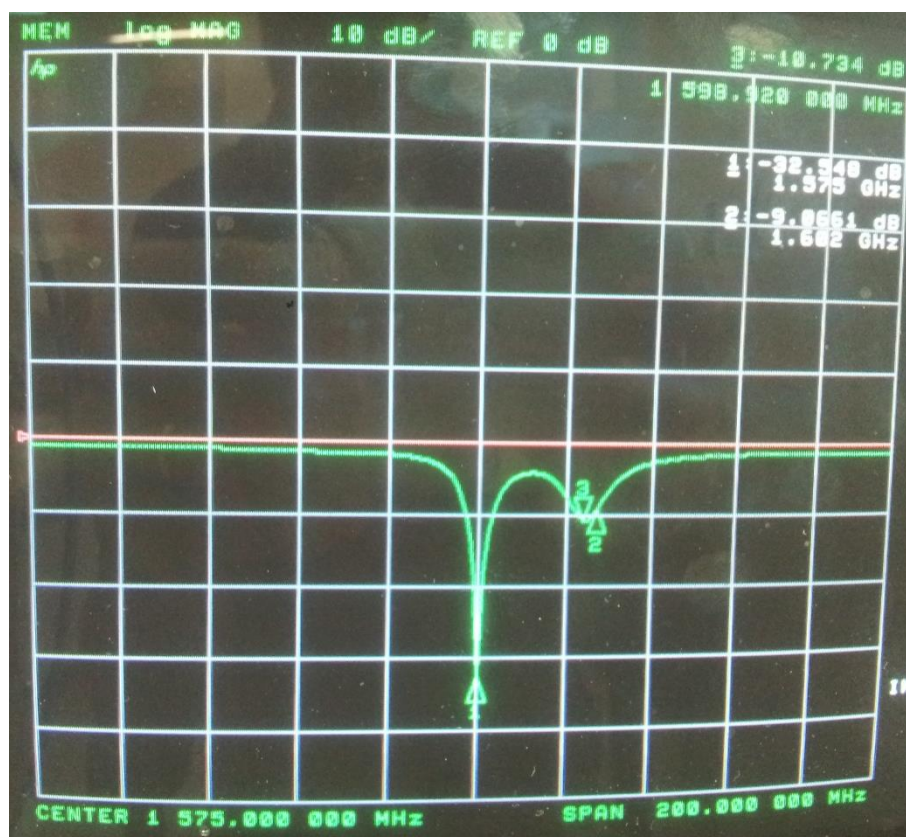


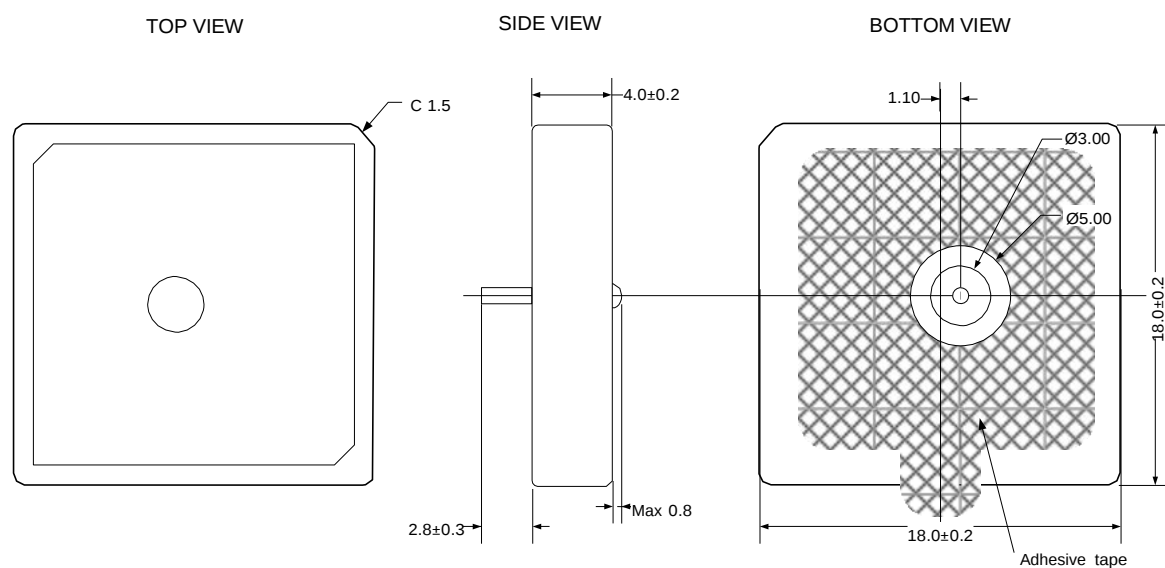
FIGURE 1 – S11 SMITH CHART

Note: Measured on 18x18mm FR4 based ground plane with adhesive tape



13. MECHANICAL SPECIFICATIONS

13.1. DIMENSIONS



All dimensions are in mm

FIGURE 2 – MECHANICAL OUTLINE

Dimensions	Length	Width	Thickness	Weight	
mm	18.0 ± 0.2	18.0 ± 0.2	4.0 ± 0.2	gr	7.6
inch	0.709 ± 0.008	0.709 ± 0.008	0.157 ± 0.008	oz	0.32

TABLE 4 – MECHANICAL INFORMATION

13.2. MATERIALS

Item	Material
Electrode (Top and Bottom)	Silver
Probe	Silver Plated Brass
Probe pin solder material	Stannum
Dielectric constant	
Adhesive tape thickness	0.125mm (typ.)

TABLE 5 – MATERIALS



14. SOLDERING CONDITION

Compatibility to IEC 68-2-58: $\geq 75\%$ (after aging)

Manual iron soldering (Solder Sn/Ag/Cu 96.5/3.0/0.5)

Note: Soldering conditions must comply to prevent degradation of antenna performance.

15. STORAGE

Electrode metallization is unprotected silver and will tarnish after opening.

Elevated temperature and humidity will accelerate tarnishing process.

Typical floor life should not exceed 6 months after package has been opened.

Bulk antennas older than 6 months should be tested for solderability before use.

Avoid intentional shock or drop to prevent cracking of antenna.

16. COMPLIANCE

Antennas are designed and being manufactured and handled to comply with and according to Pb-Free/RoHS Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment.



Antennas are manufactured in ISO 9001:2000 accredited facilities.

Antennas are manufactured in ISO 14001:2004 accredited facilities.

17. RELIABILITY

Parameter	Description	Pass Criteria
Drop Test	Place antenna on set 1.5m height Drop 5 times	1. No visible damage 2. S11 is acceptable ($\Delta f_c < 0.2\%$)
Vibration Test	Sine sweep 5Hz – 55Hz – 5Hz, 1 octave/min Amplitude = 1.5mm Acceleration = 2g Crossover frequency = 18Hz Hold time = 2hr.	1. No visible damage 2. S11 is acceptable ($\Delta f_c < 0.2\%$)
Humidity	60°C, 95% RH, 96hr.	1. No visible damage 2. S11 is acceptable ($\Delta f_c < 0.2\%$)
Thermal Shock	+80°C (30 min) → 5 min → -40°C (30 min) 10 cycles	1. No visible damage 2. S11 is acceptable ($\Delta f_c < 0.2\%$)
High Temperature Resistance	+90°C, 96hr.	1. No visible damage 2. S11 is acceptable ($\Delta f_c < 0.2\%$)
Low Temperature Resistance	- 40°C, 96hr.	1. No visible damage 2. S11 is acceptable ($\Delta f_c < 0.2\%$)
Adhesion Strength of Soldering	Use of pull-push gauge	Spec (min. 5kgf)
IEC Climatic Category (IEC88-1)	-40°C / +90°C / 56hr.	

TABLE 6 – RELIABILITY DATA

Notes:

- + Sample must satisfy the requirement after 24 hours of test
- + Based on IEC climatic category (IEC68-1) -40°C / +85°C / 56hr.