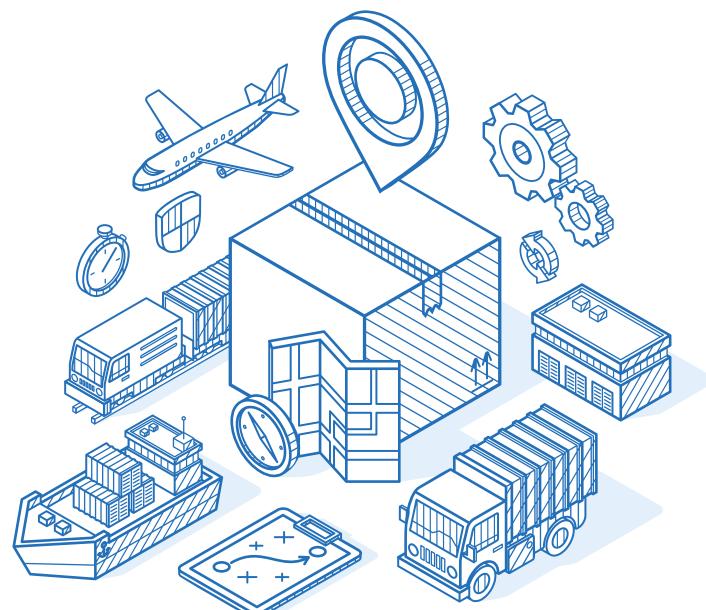


# GNSS/GPS/GLONASS/BeiDou/Galileo

## ANTENNA GUIDE

## OVERVIEW

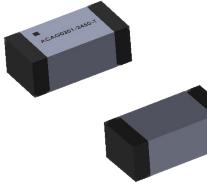
A satellite-based system enables navigation and positioning of devices. Almost all wireless devices that we come across are equipped with GPS/GNSS technology. GPS is available to anyone, everywhere and can be implemented free of charge, with the exception of equipment costs. Navigation and positioning of devices have become crucial in many applications including location-based services, tracking, surveying, mapping and timing-clock synchronization. Antennas play a crucial role in maximizing the GNSS receiver performance. Our broad range of passive and active internal and external antenna solutions are optimized for high precision applications.



## FEATURES

- Multi-satellite constellation support GPS L1/L2/L5, GLONASS, BeiDou, Galileo
- Passive and active antennas
- Active antennas with integrated LNA and filter
- Stacked patch antennas for high precision L2 and L5 bands
- Outdoor weather resistance
- Compact and low-profile options
- High gain
- Good radiation pattern stability
- High positioning accuracy
- Easy installation
- Variety of mounting styles
- Customizable cable length and connector

## ANTENNA TYPES



CHIP



PATCH



FLEXIBLE



EXTERNAL

# GNSS/GPS/GLONASS/BeiDou/Galileo

## CHIP ANTENNAS

### OVERVIEW

Abracon's GNSS chip antennas are miniature, lightweight solutions that are commonly preferred for compact or portable devices. They are the most cost-effective, off-the-shelf option available in the market. Abracon's chip antennas are surface mount devices (SMD) that require a metal clearance area underneath them and a surrounding ground plane to radiate. The quarter wave length design of the chip antenna along with the ground plane enables them to radiate omnidirectionally, which helps when the position or orientation of a device changes with time. There are solutions for global navigation band L1, as well as solutions that cover global constellations including GPS, GLONASS, Galileo, BeiDou. Our GNSS chip antenna evaluation boards makes it easy to test out the electrical performance of the antennas.

### FEATURES

**Size:**  
Low profile

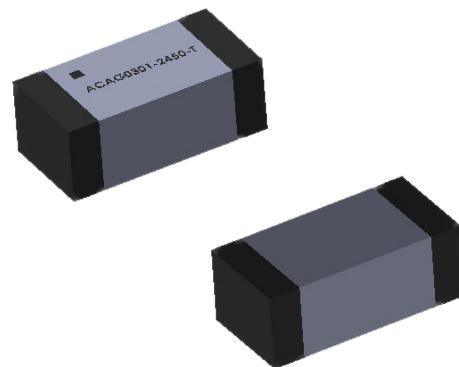
**Mounting option:**  
Surface mount

**Radiation pattern:**  
Omnidirectional  
(preferred)

**Performance:**  
High gain  
Key requirement for  
satellite systems

### APPLICATIONS

- IoT
- Wearables
- Navigation devices, tracking, geolocation
- Tablet and mobile devices
- GPS accessories: USB dongle, SDIO cards



# GNSS/GPS/GLONASS/BeiDou/Galileo

## FLEXIBLE PCB ANTENNAS

### OVERVIEW

GNSS flexible PCB antennas are low profile solutions which are most suitable for compact or portable applications. They are constructed on substrates such as polyimides and offer flexibility in mounting. They are ground independent and are mounted on plastic (e.g. ABS) or glass surfaces which make them suitable for applications where PCB space is valuable or not available. Single and multi-band GNSS antenna solutions with high performance can be designed in compact form factors. Optimization may be required to account for any detuning due to the dielectrics in plastic housing. These adhesive mount solutions come with a cable and U.FL/IPEX connectivity, which can be tailored to customer needs.

### FEATURES

**Size:**  
Low profile

**Mounting option:**  
Surface mount  
(peel and stick)

**Radiation pattern:**  
Omnidirectional  
(preferred)

**Performance:**  
High gain  
Key requirement for  
satellite systems

### APPLICATIONS

- IoT
- M2M
- Logistics
- Wearables
- Geofencing
- Surveying and mapping systems
- Remote technology monitoring



# GNSS/GPS/GLONASS/BeiDou/Galileo

## PATCH ANTENNAS

### OVERVIEW

Patches are a type of radio antenna commonly made of ceramics and metal radiating surface. They are mounted on a metal ground plane which helps them to improve the sensitivity towards satellites. These are the most preferred antennas in the GNSS space because of their high-gain characteristics, as well as their compact form factor. Patches come in passive and active types with active patches integrated with low noise amplifier. Performance of the GNSS patch antenna depends on the ground plane size and have highly directional radiation patterns. The stacked passive and active patch antennas guarantee improved navigation accuracy and fast positioning for GNSS applications.

### FEATURES

**Varying sizes:**  
9x9mm to  
36x36mm

**Mounting option:**  
Through-hole  
Surface mount  
Connector mount

**Polarization:**  
Circular Polarization  
(Preferred)

**Other options:**  
Passive/Active/  
Stacked passive/  
Stacked active

**Performance:**  
High gain  
High efficiency

### APPLICATIONS

- IoT
- M2M
- Remote technology monitoring
- Geofencing

- Navigation
- Surveying and mapping systems
- Precision transportation
- UAVs and Robotics

- Marine
- Autonomous vehicles
- Agriculture, logistics & tracking

### PATCH ANTENNA TYPES



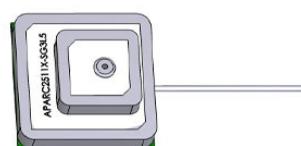
PASSIVE



ACTIVE



PASSIVE STACKED



ACTIVE STACKED

# GNSS/GPS/GLONASS/BeiDou/Galileo

## EXTERNAL ANTENNAS

### OVERVIEW

External antennas offer the best overall performance and are ideal for high performance or mission critical applications. The larger size of the external antennas helps capture better satellite signals. Based on the design, while some antennas may require an additional ground plane most are independent of a ground plane. Additionally, enhanced performance is achieved with an integrated low-noise amplifier and low-loss prefilters. Weatherproof solutions with IP rating and UV coating offer extended durability in outdoor conditions. These antenna models come in different mounts and can be custom configured with a variety of cables and connectors suitable for any application.

### FEATURES

**Size:**  
Various sizes and form factors

**Mounting option:**  
Magnetic, Adhesive, Screw, Connector

**Customization:**  
Cable and connector

**Performance:**  
High gain LNA with filter options  
Improved receiver sensitivity

### APPLICATIONS

- IoT
- M2M
- Surveillance

- Fleet management and asset tracking
- Autonomous driving
- Telematics

- Agriculture
- Instrumentation
- Survey

### EXTERNAL ANTENNA TYPES



WHIP



PUCK



DOME

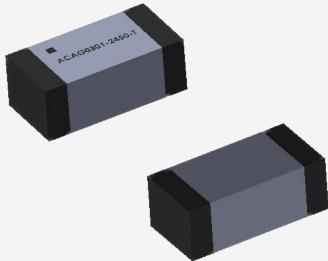


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# ANTENNA OPTIMIZATION SERVICE

## OVERVIEW

### MAXIMIZE EFFICIENCY, GAIN AND RANGE



Abraccon offers in-system tuning services for patch and chip antennas. By characterizing the antenna performance in the end system or product, this service takes the guess work out of RF verification while offering corrective measures that re-tune the system for center frequency and impedance mismatch. This provides maximum system efficiency delivering many benefits including, extended RF range, improved sensitivity and can reduce the required power consumption for a given level of transmit range.

#### Orderable Part Number: ABAOS-5WK

##### Patch Antennas

This service is offered for any Abraccon series of passive patch antennas covering a variety of RF bands from 800MHz to 6000MHz including applications such as RFID, GPS/GNSS, WiFi, ISM radios, and Iridium. In most cases, tuning is required after the patch antenna is mounted in the end-application, especially if the antenna operating bandwidth is narrow. Passive patch antennas should be tuned to the ground plane to which they are mounted. This compensates for the frequency shifts occurring due to the particular device environment in which the antenna is placed. There are several methods to tune the patch antenna such as moving the feed point, changing the shape of the top silver electrode, and removing the corners or sides of the top silver plate.

##### Chip Antennas

This service also applies to any Abraccon series of chip antennas. For chip antennas, the efficiency of the antenna depends mainly on the size and shape of the ground plane to which it is mounted as well the impedance matching of the antenna to the feed line. The antenna has to be tuned to center resonant frequency by matching the impedance to the antenna using inductors and capacitors. Higher efficiency guarantees more radiated power and increased operating range for the antennas.

FOR MORE ANTENNA OPTIMIZATION SERVICE INFO, VISIT [ABRACON.COM](http://ABRACON.COM)