

ACTPAT154 ACTIVE GPS ANTENNA

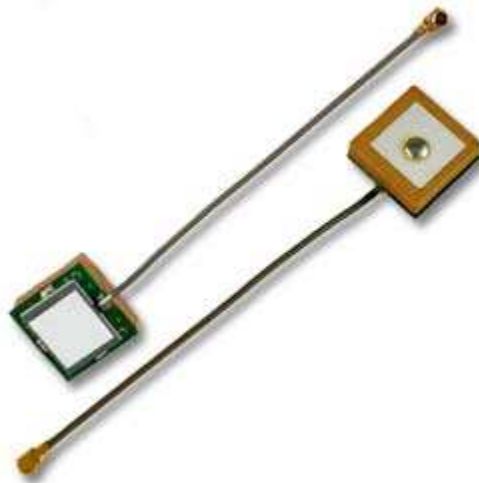
Functional Specification



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Overview

Inventek's GPS antenna, part number, ACTPAT154-01-IP is designed to work with a variety of GPS receivers. The active antenna is designed to snap directly onto the Inventek GPS modules ISM300F1 and ISM300F2 Family of GPS receivers.

The standard model is made from ceramic and comes with a LNA and mini coaxial 1.13mm cable with a U.FL RF connector that you can mount it directly on the board or attach to your GPS receiver. The active antenna can be used in a variety of applications including automotive with an impedance of 50 ohms.

The antenna, P/N ACTPAT154-01-IP lets you integrate low cost GPS functionality into your product quickly and easily. It's suitable for a wide range of applications, including the most compact:

- Hand-held personal positioning and navigation
- External PDAs, Pocket PCs and other hand-held computers
- Fleet management
- Asset tracking
- Automatic vehicle location

The ACTPAT154-01-IP provides world class performance suits it to navigating urban canyons, as well as wide-open spaces. Being lead-free, it complies with the European Union's RoHS (Restriction of Hazardous Substances) directive.

Mechanical

Table 1 summarizes the dimensions of the Antenna.

| Parameter | Value |
|-------------|-------------------------------|
| Rectangular | 15.2 x 15.2 mm |
| Width | 7.0 ± 0.2 mm including Shield |
| Color | Brown with silver shield |
| Impedance | 50 Ohms |
| Connector | IPEX U.FL (MHFI) |

Table 1 Mechanical



Figure 1 Patch Dimension (mm)

Thermal

| Name | |
|-----------------------------|---------------------------------|
| Operation Temperature range | -40 to +85 °C |
| Storage temperature | -40 to +90 °C |
| Humidity | 10 to 95% RH |
| Frequency Temp Coefficient | 20 max ppm/ °C at -40 to -90 °C |

Table 2 Antenna Temperature

Power

Table 3 summarizes the Antenna's power requirements.

| Parameter | Value |
|---------------------|-----------------|
| VCC | 2.7–5.4 V dc |
| Continuous tracking | 10 mA @ 3 Volts |

Table 3 Power Requirements

You can reduce power consumption by turning on the antenna and only when needed to acquire a fix.

Patch Characteristics

The Patch characteristics are measured with 70x70 mm ground plane in an anechoic chamber. Active antenna ESD test (working): >16kv (contact discharge with radome)

| Antenna | Value |
|---|---------------------|
| Patch Center Frequency | 1578.00 +/- 2.0 Mhz |
| Patch Bandwidth (under -10 dB return loss) | 5 Mhz min |
| Patch Gain at Zenith | + 0.5 dBic Typical |
| Patch Gain at 10 degrees elevation | -5.5 dBic min |
| Polarization | R.H.C.P |
| Axial Ratio | 2.0 dB Typical |

Active Antenna and LNA Characteristics

| LNA | Value |
|-------------------|-------------------------------|
| Gain | 26 to 35 dB (@ 3volts 24 dB) |
| Noise figure | 1.4 dB (@ 3 volts 1.35dB) |
| Output VSWR | DC= 1.5 max |
| *Center Frequency | 1575.42+/- 1.0 Mhz |

* Center Frequency may be offset based upon the surroundings. ACTPAT154 has been tuned and tested in free space with printed circuit board and shield as shown in Figure 1.

Far field amplitude excluding the LNA gain

Here is an example of Radiation Pattern of the patch (0 and 90°) Far field amplitude excluding the LNA gain. The Patch characteristics are measured with 50x50 mm ground plane in an anechoic chamber. Active antenna ESD test (working): >16kv (contact discharge with radome)

0° degrees

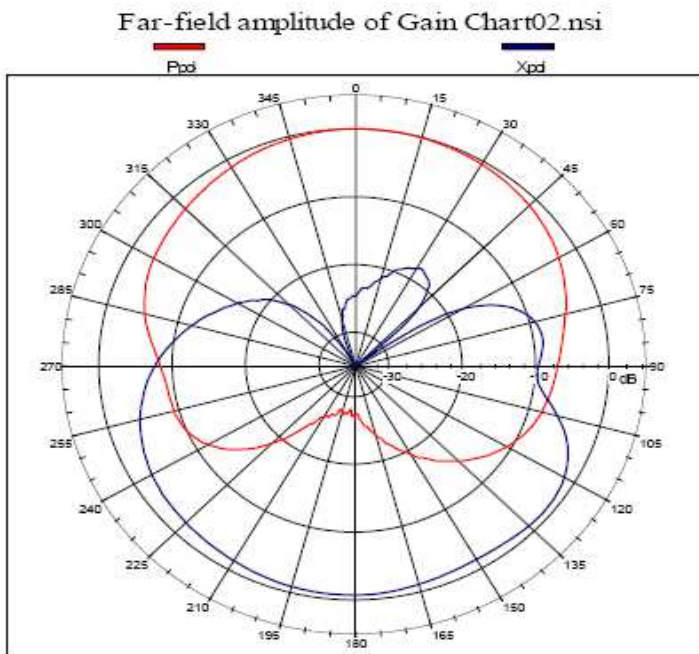
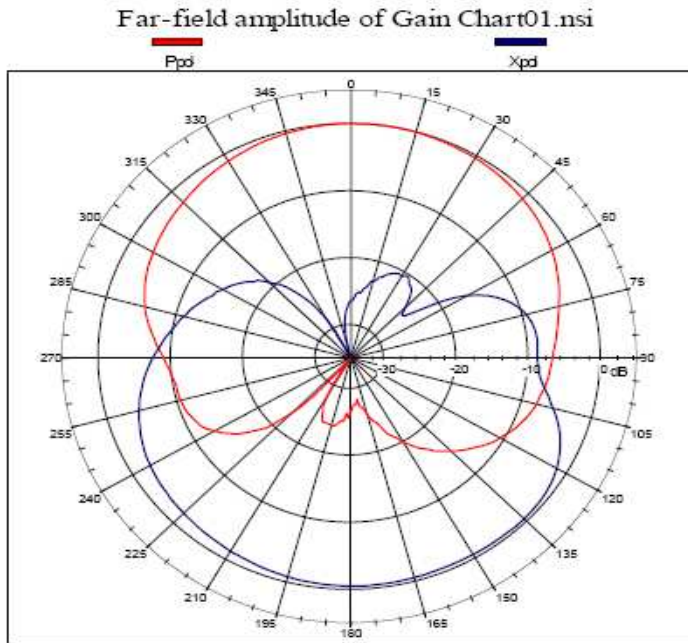


Figure 3 Radiation Pattern (Excluding LNA Gain) (90°)

Shipping

- Each antenna is individually packaged in Plastic bags
- All bags are sealed, impulse sealer
- 20 units per tray
- All material and components are ROHS compliance

Ordering Information

The Antenna is RoHS-compliant and you can custom configure the cable length, type and connector type. Min orders are required for custom builds. Please specify the corresponding part number when ordering.

Build a part number:

The following ordering configurations are available by order:

P/N: ACTPAT154-**XX**-**CT**

(XX) = Cable length 01: 63 mm , xx: Custom length in meters

(CT) = Connector Types

00 : No connector

IP: IPEX U.FL connector

HR: Hiroshi U.FI connector (non standard)

xx: Custom connector

Ordering Part number sequence example

Standard Parts:

| Part No. | Antenna Type | Connector Type | Cable Length Inches | Cable Length (mm) |
|-----------------|------------------|---------------------|---------------------|-------------------|
| ACTPAT154-01-IP | 15.2 x15.2 x7 mm | *Iplex U.FL (MHFI) | ~ 2.5 | 63 mm |
| ACTPAT154-01-00 | 15.2 x15.2 x7 mm | None | ~ 2.5 | 63 mm |
| ACTPAT154-07-00 | 15.2 x15.2 x7 mm | None | ~ 6.5 | 164mm |
| ACTPAT154-07-1P | 15.2 x15.2 x7 mm | Iplex U.FL (MHFI) | ~ 6.5 | 164mm |

* Hirose U.FL compatible