Mil-Con Active & Passive GPS Antennas

Product Description

Mil-Con’s rugged, sealed, field-replaceable, shock-mounted GPS Antennas use a commercial quadrifilar helix antenna element in spin-on SMA and TNC versions, as well as, slide-on SMB version. The antennas are designed using compliant RF connection that combines mechanically isolated ceramic antenna elements with integrated weather seals for use in hostile and military environments. Mil-Con offers design and manufacturing capabilities to provide unique solutions for integrating customer selected antenna elements into connector electrical and mechanical packages to meet demanding environmental and mechanical requirements.

Features

- Sealed to 1 meter of water depth.
- Advanced assembly tuning to maintain antenna element match and minimize losses.
- PkZ® technology allows a compliant connection to the element; avoiding stress to solder joints and mechanical shock to ceramic element.
- Compatible with end-user mating interfaces, such as: SMA, TNC, and slide-on SMB. Other interfaces could be made available at customers’ request.
- Adaptable to a wide range of COTS or proprietary antenna elements.

Applications

- Hand-held communication devices and two-way radios.
- GPS tracking communication devices; satellite up-links, etc.
- Stationary or portable platforms; buoy, etc.
- Deployable telecommunications equipment.

Antenna Types

- Passive (integrated element matching circuit).
- Active (integrated LNA).

Both GPS antenna types are available in the same connector options.
Materials and Finishes

Radome—Thermoplastic, Black Color.
Body—Brass, Gold Or Electroless Nickel-Plated.
Insulators—PTFE, White Color, And Thermoplastic, Various Colors.
Center Contact—Brass Or BeCu; Gold-Plated.
Antenna Element—Ceramic Loaded Miniature Quadrifilar Helix.
Seals And Shock Mounts—Silicone Rubber, Various Colors.

Mechanical and Electrical Performance

Typical Passive GPS Antenna Tuning
## Typical Active GPS Antenna Tuning

![Graph showing typical active GPS antenna tuning](image)

## GPS Antennas Mechanical Performance

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Passive Antenna</th>
<th>Active Antenna</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Shock</td>
<td>-55°C to +85°C, 5 cycles, 1 hour at each temperature extreme</td>
<td>-40°C to +85°C, 5 cycles, 1 hour at each temperature extreme</td>
</tr>
<tr>
<td>Leak</td>
<td>Underwater @ 5 psi for 1 minute minimum</td>
<td>Underwater @ 5 psi for 1 minute minimum</td>
</tr>
<tr>
<td>Moisture Resistance</td>
<td>Method IV of EIA-364-3, except for Step 7a</td>
<td>Method IV of EIA-364-3, except for Step 7a</td>
</tr>
<tr>
<td>Durability</td>
<td>500 mates minimum</td>
<td>500 mates minimum</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>-55°C to +85°C</td>
<td>-40°C to +85°C</td>
</tr>
</tbody>
</table>

---

**Mil-Con, Inc.**  
555 Pond Drive, Wood Dale, IL 60191 USA  
Tel: (630) 595-2366 • Fax: (630) 616-2299  
www.mil-coninc.com
# GPS Antennas Electrical Performance

<table>
<thead>
<tr>
<th>Characteristic/Requirement</th>
<th>Passive Antennas</th>
<th>Active Antennas</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.C.</td>
<td>D.C. Continuity from Coaxial Center Pin to Ground</td>
<td>Require 2.8 to 3.6 VDC and present a max load of 15 mA</td>
</tr>
<tr>
<td>* VSWR over the L1 C/A Frequency Range (1571.42 +/- 1.023 MHz)</td>
<td>&lt; 1.92</td>
<td>&lt; 2.3 when powered</td>
</tr>
<tr>
<td>Bandwidth (typical)</td>
<td>Ref. MEM (magenta) trace on Active Antenna Plot, lower graph</td>
<td>Ref. S12 (green trace) on the Active Antenna Plot, lower graph</td>
</tr>
<tr>
<td>* Center Frequency Accuracy (frequency of optimum circular polarization)</td>
<td>+/- 1.0 MHz by impedance test</td>
<td>+/- 1.0 MHz by relative gain test</td>
</tr>
<tr>
<td>Pattern</td>
<td>Approximately Cardiod on axis away from feed point &gt; 120 degrees, 135 degrees typical</td>
<td></td>
</tr>
<tr>
<td>Gain</td>
<td>-2.8 dBic optimally, -4.0 dBic typical (on zenith when lengthwise direction of antenna is vertical)</td>
<td>Preamp: 22 dBtypical*, with 1.3 dB max Noise Figure, and 10 dBm typical Third Order Intercept</td>
</tr>
</tbody>
</table>

*Indicates a 100% tested specification or characteristic

# Size and Dimensions

*SMA Interfacial Seal Will Be Achieved Only When Mated To 2033-1100-02P Adapter. Consult Factory For Custom Applications.
**Reverse Polarity TNC Could Be Made Available.**
Please Consult Factory For Details.

*Reverse Polarity TNC Could Be Made Available. Please Consult Factory For Details.*

*SMA Interfacial Seal Will Be Achieved Only When Mated To 2033-1100-02P Adapter. Consult Factory For Custom Applications.*

THE ITEM(S) / TECHNICAL DATA ON THIS / PRECEDING PAGE(S) ARE CONTROLLED BY THE DEPARTMENT OF STATE, INTERNATIONAL TRAFFIC IN ARMS REGULATION(S) (ITAR) 22 CFR PARTS 120-130 AND CANNOT BE EXPORTED FROM THE UNITED STATES OR SHARED WITH A FOREIGN NATIONAL WITHOUT PRIOR APPROVAL FROM THE UNITED STATES GOVERNMENT.