



HORIZONTALLY POLARIZED DUAL BAND GPS ANTENNA

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SD# 14293.1

Technology Readiness Level: 9

Operational Use of Deliverable

A mechanically robust, horizontally polarized dual band GPS antenna with improved performance in cluttered signal environments

Antennas are ubiquitous in devices and systems used by consumers, industry, and government. Often, these systems employ multiple antennas which can result in undesired interference that reduces the effectiveness of sensitive GPS systems. A need exists for GPS antennas that both resist coupling with neighboring antennas and can withstand harsh environmental conditions.

Sandia researchers have developed a mechanically robust, horizontally polarized dual-band GPS antenna with improved performance in cluttered signal environments. This is achieved with an array design featuring several dipole antennas arranged in a circular pattern from a central plate with an electrical feed. The antenna's horizontal polarization mitigates coupling between itself and orthogonally polarized antennas in its environment. The dual band (L1 and L2) antenna has a wide field of view and is designed to survive high-shock and high-temperature environments. Its design provides additional benefits such as structural stability, thermal handling, and mitigation of electrostatic discharge. This device has the potential to vastly improve GPS reception and performance in harsh and varied environments.

TECHNICAL BENEFITS

- Mitigates coupling with neighboring orthogonally polarized antennas
- Preserves pattern quality in cluttered environments and reduces interference
- Dual band (L1 and L2 GPS frequencies) with wide field of view
- Tunable features, including shorting pin locations/radius and lengths/widths of feed network and dipole
- Robust antenna and feed design for high-shock, high-temperature environments
- Mitigates electrostatic discharge (ESD)

INDUSTRIES & APPLICATIONS

- Aircraft and aerospace
- Automotive and transportation
- Communications
- Defense/security
- Extreme environments

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