

Antenna Development Corporation

151 S. Walnut St. #B-6, Las Cruces, NM 88001

Cylindrical Array Microstrip Patch Antenna

Specifications



(Shown without anti-charging cover)

- Space qualified with heritage - reliable
- Low mass
- High performance – robust structure

Antenna Development Corporation, Inc. (*AntDevCo*) employees have designed and manufactured spacecraft microstrip patch antennas for many successful spacecraft programs during their employment at the Physical Science Laboratory at New Mexico State University. As the result of a memorandum of understanding with NMSU, *AntDevCo* is able to offer these well-proven antennas.

The units are capable of supporting high data rates and at radiating power up to 10 Watts CW. The antennas can be specified as either for either circular polarization and are offered with either dual frequency operation realized by a stacked patch configuration or single frequency operation. The antenna incorporates an integral radome and is a very robust assembly. A cover for the prevention of static charge accumulation is an available option.

All antennas are supplied with extensive testing data including principal plane radiation pattern plots, gain bounds plots, and coverage statistics. Simulations of the expected performance on your satellite can also be ordered.

This antenna is designed to be placed on a spar and located some distance above the spacecraft deck. It provides nearly omni-directional gain coverage with good axial ratio and high efficiency.

Simulations and measurements must be used to determine the antenna pattern when the antenna is mated with the spacecraft. The specifications provided are for isolated antennas.

- Gain: > -5 dBic typical (see patterns)
- Frequency: Any single TX/RX channel pair
(Receive) 1700 – 2100 MHz,
(Transmit) 2200 – 2300 MHz

The design is capable of customization to provide operation at center frequency pairs taken from the USAF SGLS and NASA SN bands. Note that the customer must specify the center frequencies desired at the time of order – these are narrow band antennas and a single antenna will not cover the entire bands.

- Bandwidth: 5 MHz about the center frequencies
- Polarization: Circular or linear (customer spec.)
- Power: 10 Watts CW (previous tests, not the ultimate power limit)
- HPBW: See patterns
- Axial Ratio: < 6 dB over most of 4-pi steradians – see patterns
- Impedance: 50 Ohms nominal
- VSWR: < 1.5 over RX and TX bandwidths
- Magnetic: Antenna materials are non-magnetic, low magnetic stainless steel connector standard. (Non-magnetic brass connector optional.)
- Connector: SMA female
- Dimensions: OD ~ 6", ID = 4.070"
- Mass: 620 grams (stacked unit)
- Temperature: -100 C to +100 C
- Radome Surface: ~ 10¹⁰ Ω/square (no cover)
~ 10⁸ Ω/square (Ge on Kapton)
- IR Emissivity = 0.90 (no cover)
Absorptivity = 0.43 (no cover)
Emissivity = 0.72 (ESD cover)
Absorptivity = 0.45 (ESD cover)
- Vacuum Properties:
 - % CVCM < 0.01 (antenna material)
 - % TML < 0.13 properties, no cover)
 - % WVR < 0.02
 - % CVCM < 0.1 (Ge/Kapton cover properties)
 - % TML < 1.0, % WVR < 1.0
- Thermal Interface: Internally heat is conducted through the ground plane of the antenna.