Ceramic and LDS-MID GPS† Antenna

Eliminating space and PCB real-estate constraints, LDS-MID and Ceramic GPS antennas combine ease of integration with reduced cost of implementation over a variety of wireless navigation device applications.

Features and Benefits

- **Silver Pin**: Positions and fixes the antenna to the PCB (via soldering); provides electrical contact between antenna and board.
- **Feeding Pad (Double-sided adhesive)**: Secures the antenna to the PCB.
- **Horizontal Plane of PCB**: Helps ensure highest gain from the antenna. The patch antenna achieves highest gain when placed horizontally on a surface facing the z-axis since it can receive all propagated GPS signals. Lower gain will be experienced if the patch antenna is mounted on a surface that makes an angle with the horizontal.
- **RHCP SMT GPS Ceramic Antenna (Series 146168)**: Pick-and-place Feature speeds up automated placement of antenna during assembly.
- **Gold (Au) over Nickel (Ni) Traces**: Act as transducers that convert unguided electromagnetic waves to guided electromagnetic waves and vice versa.
- **Laser Direct Structuring (LDS)-formed Antenna Radiator**: Yields high, consistent RF performance, leveraging the excellent laser structuring precision, speed, accuracy and repeatability of LDS technology.
- **Halogen-free Molded Interconnect Device (MID) Housing**: Environmentally sustainable housing material withstands high reflow temperatures during assembly processing.
- **Double-sided Adhesive Liner**: Enables easy peel-and-stick operations on PCB.
- **Fixing Pads**: Firmly anchor antenna housing onto SMT pad of PCB.
- **RHCP SMT GPS LDS-MID Antenna (Series 146216)**: Connects to the radio transceiver via a 50-Ohm transmission line on the PCB. Electrical signals from the transmission line are fed through this pad on the PCB.
- **Helix SMT GPS LDS-MID Antenna (Series 146235)**

*RHCP — An industry acronym for “Right Hand Circularly Polarized”.
†GPS - Global Positioning System. Civilian GPS uses the L1 frequency of 1575.42 MHz in the Ultra High Frequency (UHF) band spanning 300MHz to 3GHz.
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Applications
Automotive
Commercial Vehicle
  Agricultural Vehicle
  Rail
Commercial Aviation
Consumer (Recreational)
  Geocaching
Industrial
  Maritime Port Management System
  Surveying and Mapping Systems
  Emergency Response Systems

Specifications
REFERENCE INFORMATION
Packaging:
  Tape on reel (146216, 146235), Tray (146168)
Reference Platform:
  100.00 by 100.00 by 1.00mm (146216); 100.00
  by 50.00 by 1.00mm (146235); 70.00 by
  70.00mm (146168)
Designed In: Millimeters
RoHS Compliant: Yes
Halogen-free: Yes
Ground Clearance: Refer to Application Specification
  of each respective Series

ELECTRICAL
RF Power (Watt): 2
Return Loss - S11(dB):
  <-10 (146216, 146235); <-15 dB (146168)
Average Total Radiation Efficiency(%):
  >57 (146216); >55 (146235); >75 (146168)
Peak Gain (dBi):
  1.0 (146216); 1.4 (146235); 5.5 (146168)
Polarization: RHCP (146216, 146168);
  Elliptic (146235)
Input Impedance (ohms): 50

PHYSICAL
Housing: LCP-LDS, Vectra E840LDS, 40% mineral-
  filled LDS grade
Flammability: UL 94V-0
Plating:
  Series 146216, 146235:
    Hatched Area — 0.05micron Gold (Au) min.
    MID Plane — 1.0 to 2.5micron Nickel (Ni)
    Under-plating — 12 to 16micron Copper (Cu)
  Series 146168:
    Silver: 8 to 10micron (Ag)
Operating Temperature: -40 to 125°C

MECHANICAL
Peeling Force (min.): 8N (146216, 146235)

Ordering Information

<table>
<thead>
<tr>
<th>Series No.</th>
<th>Frequency Band (MHz)</th>
<th>Dimensions (mm)</th>
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</thead>
<tbody>
<tr>
<td>146235</td>
<td>1561±5; 1575±5; 1602±5</td>
<td>5.00(L) by 3.00(W) by 4.00(H)</td>
</tr>
<tr>
<td>146216</td>
<td>1561±5; 1575±5; 1602±5</td>
<td>11.80(L) by 11.50(W) by 5.95(H)</td>
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<tr>
<td>146168</td>
<td>1575±3</td>
<td>25.00(L) by 25.00(W) by 4.00(H)</td>
</tr>
</tbody>
</table>

www.molex.com/link/standard_antennas.html