Part No. 1002390PT
Wi-Fi Tunable PCB 5 GHz Embedded Antenna
5 GHz
Supports: Wi-Fi applications, Agriculture, Automotive, Bluetooth, Zigbee, WLAN, Smart Home, Healthcare, Digital Signage

Ethertronics’ 1002390PT is a versatile off-board PCB antenna ideal for 5 GHz Wi-Fi applications where off-board implementation is advantageous and necessary.

1002390PT offers easy on-the-go tuning capability right on the antenna face, that is ideal for prototyping. The tuned antenna can then be hardwired by Ethertronics for mass production.

Custom cable and connector options are available. Please contact us for more information.

Electrical Specifications
Typical Performance using 100 mm cable tested on PC-ABS

<table>
<thead>
<tr>
<th>Frequency</th>
<th>5.150 – 5.825 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Gain</td>
<td>5.4 dBi</td>
</tr>
<tr>
<td>Average Efficiency</td>
<td>76%</td>
</tr>
<tr>
<td>VSWR Match</td>
<td>2.0 :1 max</td>
</tr>
<tr>
<td>Feed Point Impedance</td>
<td>50 ohms unbalanced</td>
</tr>
<tr>
<td>Polarization</td>
<td>Linear</td>
</tr>
<tr>
<td>Power Handling</td>
<td>2 Watt CW</td>
</tr>
</tbody>
</table>

Mechanical Specifications & Ordering Part Number

<table>
<thead>
<tr>
<th>Ordering Part #</th>
<th>1002390PT-AA10L0050</th>
<th>1002390PT-AA10L0100</th>
<th>1002390PT-AA10L0280</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (mm)</td>
<td>9.8 x 17.5 x 0.4 PCB (Height up to 1.80 at soldering point)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (grams)</td>
<td>0.45</td>
<td>0.60</td>
<td>1.15</td>
</tr>
<tr>
<td>Mounting</td>
<td>3M Adhesive on bottom side of antenna</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Packaging</td>
<td>PE bags</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Additional variations available with different cable lengths, colors and connectors.
5 GHz Ethertronics’ Embedded Antenna Specifications
Ethertronics produces a wide variety of standard and custom antennas to meet user needs.

**Typical VSWR, Efficiency and Peak Gain plots**
Measured in free space with PC/ABS loading and 100 mm cable
Antenna Tuning Procedure
This antenna has unique features enabling limited range RF tuning by solder bridging or cutting specified area. Ease of tuning for any application on the fly with a soldering iron and knife. Tuning optional if required.

**Antenna Tuning (Low)**

*Add bridge of solder to connect pads for tuning

**Filled Gap**

**Antenna Tuning (High)**

*Scratch solder mask to expose copper layer

*Cut trace through copper layer

**Cut Gap**
Antenna Tuning
This antenna has unique features enabling limited range RF tuning by solder bridging or cutting specified area. Ease of tuning for any application on the fly with a soldering iron and knife. Tuning optional if required.

Antenna Tuning Structure

*Area highlighted used for antenna tuning

Antenna Tuning (Low)
*Add bridge of solder to connect pads for tuning

Antenna Tuning (High)
*Cut Pads for tuning
5 GHz Ethertronics’ Embedded Antenna Specifications
Ethertronics produces a wide variety of standard and custom antennas to meet user needs.

**Tuning Options (Low)**
Stages 2-8 (Tuning antenna “Low” with solder bridge)

<table>
<thead>
<tr>
<th>Stages</th>
<th>PADS</th>
<th>Frequency shift (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OPEN</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>P1</td>
<td>-1080 -820 -780</td>
</tr>
<tr>
<td>3</td>
<td>P2</td>
<td>-980 -760 -420</td>
</tr>
<tr>
<td>4</td>
<td>P3</td>
<td>-40 -80 -40</td>
</tr>
<tr>
<td>5</td>
<td>P4</td>
<td>-70 -100 -60</td>
</tr>
<tr>
<td>6</td>
<td>P3 + P4</td>
<td>-150 -200 -130</td>
</tr>
<tr>
<td>7</td>
<td>P5</td>
<td>-100 -150 -70</td>
</tr>
<tr>
<td>8</td>
<td>P4 + P5</td>
<td>-200 -210 -90</td>
</tr>
<tr>
<td>9</td>
<td>C1</td>
<td>+110 +60 +30</td>
</tr>
<tr>
<td>10</td>
<td>C2</td>
<td>+330 +370 +120</td>
</tr>
</tbody>
</table>

**Frequency shift (MHz)**

- **Stage 2**: P1
- **Stage 3**: P2
- **Stage 4**: P3
- **Stage 5**: P4
- **Stage 6**: P3
- **Stage 7**: P5
- **Stage 8**: P4

**Tune Frequency Lower**
Apply solder bridge to designated Stages for optimal tuning.

*Measured in free space with PC/ABS loading and 100 mm cable
**Tuning Stages (High)**

Stages 9-10 (Tuning antenna “High” applying cut on designated area)

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<table>
<thead>
<tr>
<th>Stages</th>
<th>PADS</th>
<th>Cable Length 50mm</th>
<th>Cable Length 100mm</th>
<th>Cable Length 280mm</th>
<th>Frequency shift (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OPEN</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>P1</td>
<td>-1080</td>
<td>-820</td>
<td>-780</td>
<td>-780</td>
</tr>
<tr>
<td>3</td>
<td>P2</td>
<td>-980</td>
<td>-760</td>
<td>-420</td>
<td>-420</td>
</tr>
<tr>
<td>4</td>
<td>P3</td>
<td>-40</td>
<td>-80</td>
<td>-40</td>
<td>-40</td>
</tr>
<tr>
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<td>-70</td>
<td>-100</td>
<td>-60</td>
<td>-60</td>
</tr>
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<td>6</td>
<td>P3 + P4</td>
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<td>-200</td>
<td>-130</td>
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<td>-100</td>
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<td>-210</td>
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<td>+60</td>
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<td>+30</td>
</tr>
<tr>
<td>10</td>
<td>C2</td>
<td>+330</td>
<td>+370</td>
<td>+120</td>
<td>+120</td>
</tr>
</tbody>
</table>

*Ex: Tune Frequency Higher  
Apply cut to designated stage for optimal tuning.*

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*Measured in free space with PC/ABS loading and 100 mm cable*
## Mechanical Dimensions
Typical antenna dimensions (mm)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>A (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>D (mm)</th>
<th>Connector Orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1002390PT-AA10L0050</td>
<td>17.5 ± 0.3</td>
<td>9.8 ± 0.3</td>
<td>1.8 (max)</td>
<td>50 ± 3.0</td>
<td>Face Down</td>
</tr>
<tr>
<td>1002390PT-AA10L0100</td>
<td>17.5 ± 0.3</td>
<td>9.8 ± 0.3</td>
<td>1.8 (max)</td>
<td>100 ± 3.0</td>
<td>Face Down</td>
</tr>
<tr>
<td>1002390PT-AA10L0280</td>
<td>17.5 ± 0.3</td>
<td>9.8 ± 0.3</td>
<td>1.8 (max)</td>
<td>280 ± 3.0</td>
<td>Face Down</td>
</tr>
</tbody>
</table>

*Total Height of 1.8 mm includes the cable solder connection
Thickness of 0.4 mm includes PCB + adhesive thicknesses
*Connector shown in photo below is “Face Down”