APTCW5-16002800-6K00-42-D6-V
16.0 to 28.0 GHz Ultra-Low Noise Cryogenic Amplifier

**Product Features**
- Frequency Range = 16.0 to 28.0 GHz
- Typical Noise Temp = 6.3K at 6K case temp
- Gain (typical) = 32 dB
- State-of-the-Art PHEMT Technology
- MIL-883, MIL-45208 construction and reliability
- Single +2V Biasing @*~47 mA
- No dual power supply or connector needed
- SMA female connectors
- 0.030” diameter pins for DC and GND
- Custom gain and frequency options available

**Product Description**
This model is a wideband medium-gain waveguide LNA which is designed for cryogenic applications down to 4K with an industry low Noise Temperature of 90K at +23°C case temperature. The LNA has a low gain flatness and VSWR across the entire band. Lower Noise options are also available in smaller sub-bands. Compact AmpliTech D-series gold-plated package with SMA female connectors for easy installation.

**Application**
- Radiometers
- Nanophysics
- Astronomy/Observatory Receivers
- Superconductor Research Labs

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**Typical Key Parameters at 23°C**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>GHz</td>
<td>16.0</td>
<td>-</td>
<td>28.0</td>
<td>Customizable</td>
</tr>
<tr>
<td>Gain</td>
<td>dB</td>
<td>-</td>
<td>32</td>
<td>-</td>
<td>Customizable</td>
</tr>
<tr>
<td>Gain Flatness</td>
<td>dB</td>
<td>-</td>
<td>±1.5</td>
<td>-</td>
<td>Customizable</td>
</tr>
<tr>
<td>In/Out VSWR</td>
<td></td>
<td>-</td>
<td>1.5:1</td>
<td>-</td>
<td>Customizable</td>
</tr>
<tr>
<td>Output P1dB</td>
<td>dBm</td>
<td>+0</td>
<td>2</td>
<td>-</td>
<td>Customizable</td>
</tr>
<tr>
<td>DC Power</td>
<td>V@mA</td>
<td>-</td>
<td>+2.0</td>
<td>+2.0</td>
<td>10mA typ.</td>
</tr>
<tr>
<td>Noise Figure</td>
<td>dB</td>
<td>-</td>
<td>0.95</td>
<td>-</td>
<td>@6K</td>
</tr>
<tr>
<td>Outline/Package</td>
<td></td>
<td>-</td>
<td>-</td>
<td>D6</td>
<td></td>
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</table>

**Absolute Maximum Ratings**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Unit</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature (Case)</td>
<td>°K</td>
<td>+4</td>
<td>+350</td>
<td>95% humidity, non-condensing</td>
</tr>
<tr>
<td>Storage Temperature (Case)</td>
<td>°K</td>
<td>-</td>
<td>+300</td>
<td>95% humidity, non-condensing</td>
</tr>
<tr>
<td>RF Input Power</td>
<td>dBm</td>
<td>-</td>
<td>-10</td>
<td>CW</td>
</tr>
<tr>
<td>Die Junction Temp (Tj)</td>
<td>°C</td>
<td>-</td>
<td>+150</td>
<td>For GaAs devices</td>
</tr>
<tr>
<td>Positive Supply Voltage</td>
<td>V</td>
<td>-</td>
<td>+3.5</td>
<td>At +V DC terminal</td>
</tr>
<tr>
<td>Negative Voltage</td>
<td>V</td>
<td>N/A</td>
<td>N/A</td>
<td>Reverse Voltage</td>
</tr>
</tbody>
</table>

* Stresses above those listed under “Absolute Maximum Rating” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability. All STANDARD units are packaged in Aluminum housings that are layered with electroless Nickel and then plated with Gold to eliminate contamination of other adjacent electronic components.
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Gain and Noise

Gain and Noise

Input and Output VSWR

Frequency [GHz]

S11, S22 [dB]

Frequency [GHz]

Noise [Kelvin]

Gain [dB]

Frequency [GHz]

Gain — Noise

Noise — Gain

Gain — Noise

Noise — Gain

Input Return Loss (dB) — Output Return Loss (dB)
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Outline Drawing

Note: Custom outline options available