Absolute maximum ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{ds}$</td>
<td>-0.5 V</td>
<td>3 V</td>
</tr>
<tr>
<td>$I_{ds}$</td>
<td>100 mA</td>
<td></td>
</tr>
<tr>
<td>$V_{gs}$</td>
<td>-12 V</td>
<td>+12 V</td>
</tr>
<tr>
<td>RF Input drive level</td>
<td></td>
<td>0 dBm</td>
</tr>
</tbody>
</table>

Nominal bias @ 296 K

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{ds}$</td>
<td>2.00 V</td>
</tr>
<tr>
<td>$I_{ds}$</td>
<td>47 mA</td>
</tr>
<tr>
<td>$V_{gs}$</td>
<td>-0.60 V</td>
</tr>
</tbody>
</table>

Nominal bias @ 5 K

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{ds}$</td>
<td>1.10 V</td>
</tr>
<tr>
<td>$I_{ds}$</td>
<td>12 mA</td>
</tr>
<tr>
<td>$V_{gs}$</td>
<td>-0.15 V</td>
</tr>
</tbody>
</table>
Measured data, Tamb=296 K

Gain and Noise

S11 and S22
Measured data, Tamb=5 K

Gain and Noise

Gain [dB]  Noise [K]

Frequency [GHz]

Gain [dB]

Noise [K]
LNF-LNC6_20B s/n 016
6-20 GHz Cryogenic Low Noise Amplifier

Drawings

Dimensions are in millimeters

Low Noise Factory • www.lownoisefactory.com • info@lownoisefactory.com
Nano-D panel connector seen from outside the LNA
Biasing procedure
For safe operation of the LNA, please carefully follow the instructions below. Always honor the maximum ratings stated in the datasheet.

With constant current supply, e.g. LNF-PS_2 and LNF-PS_EU

LNF-PS_2 is pre-tuned to the nominal bias of your LNA at cryogenic temperatures.

**Power up:**
1. Switch on the power supply
2. Double check that \( V_d \) is set to the nominal voltage in the datasheet
3. Connect the LNA’s RF input and output to your grounded test set-up
4. Connect the power supply to the LNA
5. Check that the measured \( I_{ds} \) is equal to the nominal value in this datasheet.
   Tune to the correct value if necessary.
6. Before starting a cool down, make sure that the power supply is set to the stated values at 10K. Do not cool down with the power supply set to the room temperature values.

**Power down:**
1. Disconnect the power supply from the LNA
2. Disconnect the LNA’s RF input and output
3. Switch off the power supply

With constant voltage supply, e.g. LNF-PS_1

LNF-PS_1 is pre-tuned to the nominal bias of your LNA at cryogenic temperatures.

**Power up:**
1. Switch on the power supply
2. Set \( V_d \) and \( V_g \) to the nominal voltages stated in this datasheet
3. Connect the LNA’s RF input and output to your grounded test set-up
4. Connect the power supply to the LNA
5. Fine tune \( V_g \) to get the nominal \( I_{ds} \) stated in this datasheet. The actual \( V_g \) can deviate a bit from the value in the datasheet depending on ground wire resistance in your set-up.
6. Before starting a cool down, make sure that the power supply is set to the stated values at 10K. Do not cool down with the power supply set to the room temperature values.

**Power down:**
1. Disconnect the power supply from the LNA
2. Disconnect the LNA’s RF input and output
3. Switch off the power supply