A31-1 / SMA31-1

Cascadable Amplifier
100 to 2000 MHz

Rev. V3

Features
- LOW NOISE: <3.5 dB (TYP.)
- LOW VSWR: 1.5:1 (TYP.)

Description
The A31-1 RF amplifier is a discrete hybrid design, which uses thin film manufacturing processes for accurate performance and high reliability. This single stage bipolar transistor feedback amplifier design displays impressive performance over a broadband frequency range. Both TO-8 and Surface Mount packages are Hermetically sealed, and MIL-STD-883 environmental screening is available.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>A31-1</td>
<td>TO-8</td>
</tr>
<tr>
<td>SMA31-1</td>
<td>Surface Mount</td>
</tr>
<tr>
<td>CA31-1 **</td>
<td>SMA Connectorized</td>
</tr>
</tbody>
</table>

** The connectorized version is not RoHs compliant.

Electrical Specifications: \( Z_0 = 50\,\Omega, V_{CC} = +15\, V_{DC} \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Typical</th>
<th>Guaranteed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>25ºC</td>
<td>0º to 50ºC</td>
</tr>
<tr>
<td>Frequency</td>
<td>MHz</td>
<td>1-2050</td>
<td>10-2000</td>
</tr>
<tr>
<td>Small Signal Gain (min)</td>
<td>dB</td>
<td>11.5</td>
<td>11.0</td>
</tr>
<tr>
<td>Gain Flatness (max)</td>
<td>dB</td>
<td>±0.4</td>
<td>±1.0</td>
</tr>
<tr>
<td>Reverse Isolation</td>
<td>dB</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Noise Figure (max)</td>
<td>dB</td>
<td>3.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Power Output @ 1 dB comp. (min)</td>
<td>dBm</td>
<td>-2.0</td>
<td>-4.0</td>
</tr>
<tr>
<td>IP3</td>
<td>dBm</td>
<td>+9</td>
<td></td>
</tr>
<tr>
<td>IP2</td>
<td>dBm</td>
<td>+10</td>
<td></td>
</tr>
<tr>
<td>Second Order Harmonic IP</td>
<td>dBm</td>
<td>+15</td>
<td></td>
</tr>
<tr>
<td>VSWR Input / Output (max)</td>
<td>1.5:1 / 1.3:1</td>
<td>2.0:1 / 2.0:1</td>
<td>2.0:1 / 2.0:1</td>
</tr>
<tr>
<td>DC Current @ 15 Volts (max)</td>
<td>mA</td>
<td>9</td>
<td>11</td>
</tr>
</tbody>
</table>

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Temperature</td>
<td>-62ºC to +125ºC</td>
</tr>
<tr>
<td>Case Temperature</td>
<td>+125ºC</td>
</tr>
<tr>
<td>DC Voltage</td>
<td>+18 V</td>
</tr>
<tr>
<td>Continuous Input Power (1 minute max.)</td>
<td>13 dBm</td>
</tr>
<tr>
<td>Short Term Input power</td>
<td>50 mW</td>
</tr>
<tr>
<td>Peak Power (3 µsec max.)</td>
<td>0.5 W</td>
</tr>
<tr>
<td>“S” Series Burn-In Temperature (case)</td>
<td>+125ºC</td>
</tr>
</tbody>
</table>

Thermal Data: \( V_{CC} = +15\, V_{DC} \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Resistance ( \theta_{jc} )</td>
<td>185ºC/W</td>
</tr>
<tr>
<td>Transistor Power Dissipation ( P_{d} )</td>
<td>0.050 W</td>
</tr>
<tr>
<td>Junction Temperature Rise Above Case ( T_{j} )</td>
<td>+9ºC</td>
</tr>
</tbody>
</table>

* Over temperature performance limits for part number CA31-1, guaranteed from 0ºC to +50ºC only.

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Cascadable Amplifier
100 to 2000 MHz

Typical Performance Curves at +25°C

Outline Drawing: TO-8 *

Outline Drawing: Surface Mount *

Outline Drawing: SMA Connectorized *

* Dimensions are inches (millimeters) ±0.015 (0.38) unless otherwise specified.

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