DESCRIPTION

The µPC1676G is a silicon monolithic integrated circuit employing small package (4pins mini mold) and designed for use as a wide band amplifier covers from HF band to UHF band.

FEATURES

- Excellent frequency response : 1.2 GHz TYP. @ 3 dB down below flat gain.
- High power gain : 22 dB TYP. @ f = 0.5 GHz.
- High isolation.
- Super small package.
- Uni- and low voltage operation : VCC = 5 V
- Input and output matching 50 Ω.

ABSOLUTE MAXIMUM RATINGS (TA = 25 °C)

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>SYMBOL</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
<th>TEST CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>VCC</td>
<td>6</td>
<td></td>
<td></td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Total Power Dissipation</td>
<td>PT</td>
<td>200</td>
<td></td>
<td></td>
<td>mW</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>Topt</td>
<td>−40</td>
<td>to</td>
<td>+85</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>Tstg</td>
<td>−55</td>
<td>to</td>
<td>+150</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>

ELECTRICAL CHARACTERISTICS (TA = 25 °C, Vcc = 5 V)

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>SYMBOL</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
<th>TEST CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit Current</td>
<td>Icc</td>
<td>14</td>
<td>19</td>
<td>24</td>
<td>mA</td>
<td>No Signal</td>
</tr>
<tr>
<td>Power Gain</td>
<td>GP</td>
<td>19</td>
<td>22</td>
<td>24</td>
<td>dB</td>
<td>f = 0.5 GHz</td>
</tr>
<tr>
<td>Noise Figure</td>
<td>NF</td>
<td>4.5</td>
<td>6.0</td>
<td></td>
<td>dB</td>
<td>f = 0.5 GHz</td>
</tr>
<tr>
<td>Upper Limit Operating Frequency</td>
<td>fu</td>
<td>1.0</td>
<td>1.2</td>
<td></td>
<td>GHz</td>
<td>3 dB down below flat gain</td>
</tr>
<tr>
<td>Isolation</td>
<td>ISL</td>
<td>24</td>
<td>28</td>
<td></td>
<td>dB</td>
<td>f = 0.5 GHz</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>Rlin</td>
<td>9</td>
<td>12</td>
<td></td>
<td>dB</td>
<td>f = 0.5 GHz</td>
</tr>
<tr>
<td>Output Return Loss</td>
<td>ROut</td>
<td>6</td>
<td>9</td>
<td></td>
<td>dB</td>
<td>f = 0.5 GHz</td>
</tr>
<tr>
<td>Maximum Output Level</td>
<td>PO</td>
<td>3</td>
<td>5</td>
<td></td>
<td>dBm</td>
<td>f = 0.5 GHz, Pn = 0 dBm</td>
</tr>
</tbody>
</table>

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TYPICAL CHARACTERISTICS \( (T_A = 25 \, ^\circ\text{C}) \)

- **CIRCUIT CURRENT vs. SUPPLY VOLTAGE**
  - Graph showing \( I_{CC} \) vs. \( V_{CC} \)
  - \( V_{CC} \) range: 0 to 6 V
  - \( I_{CC} \) range: 0 to 25 mA

- **CIRCUIT CURRENT vs. OPERATING TEMPERATURE**
  - Graph showing \( I_{CC} \) vs. \( T_{op} \)
  - \( T_{op} \) range: -50 to 100 \( ^\circ\text{C} \)
  - \( I_{CC} \) range: 0 to 30 mA

- **NOISE FIGURE AND INSERTION POWER GAIN vs. FREQUENCY**
  - Graph showing \( G_P \) and \( NF \) vs. \( f \)
  - \( f \) range: 60 to 2000 MHz
  - \( G_P \) range: 0 to 30 dB
  - \( NF \) range: 0 to 30 dB

- **INSERTION POWER GAIN vs. FREQUENCY**
  - Graph showing \( G_P \) vs. \( f \)
  - \( f \) range: 60 to 2000 MHz
  - \( G_P \) range: 0 to 30 dB

- **REVERSE INSERTION GAIN vs. FREQUENCY**
  - Graph showing \( ISL \) vs. \( f \)
  - \( f \) range: 60 to 2000 MHz
  - \( ISL \) range: -30 to 0 dB

- **INPUT AND OUTPUT RETURN LOSS vs. FREQUENCY**
  - Graph showing \( RL_{in} \) and \( RL_{out} \) vs. \( f \)
  - \( f \) range: 60 to 2000 MHz
  - \( RL_{in} \) range: -30 to 0 dB
  - \( RL_{out} \) range: -30 to 0 dB

- **Noise Figure and Insertion Power Gain**
  - \( V_{CC} = 5.5 \, V \)
  - \( V_{CC} = 5 \, V \)
  - \( V_{CC} = 4.5 \, V \)

- **Operating Temperature**
  - \( V_{CC} = 5 \, V \)
  - \( T_A = -40 \, ^\circ\text{C} \)
  - \( +25 \, ^\circ\text{C} \)
  - \( +85 \, ^\circ\text{C} \)
**S-PARAMETER**

\( V_{CC} = 5 \, \text{V}, \quad Z_0 = 50 \)

| \( f \) (MHz) | | | | | | | |
|---|---|---|---|---|---|---|
| 100 | 0.072 | −26.5 | 8.955 | −15.3 | 0.034 | −2.0 | 0.220 | 171.2 |
| 200 | 0.093 | −63.5 | 9.327 | −31.3 | 0.035 | −3.4 | 0.233 | 161.3 |
| 400 | 0.175 | −120.4 | 11.021 | −66.2 | 0.038 | −8.4 | 0.303 | 139.4 |
| 600 | 0.355 | −176.4 | 14.504 | −114.3 | 0.042 | −18.4 | 0.408 | 107.7 |
| 800 | 0.485 | 118.7 | 14.530 | 177.1 | 0.037 | −25.7 | 0.361 | 65.5 |
| 1000 | 0.387 | 77.5 | 9.478 | 123.1 | 0.044 | −20.5 | 0.231 | 61.6 |
| 1200 | 0.298 | 59.2 | 6.301 | 85.6 | 0.057 | −28.3 | 0.251 | 68.0 |
| 1400 | 0.243 | 50.5 | 4.562 | 53.8 | 0.070 | −41.5 | 0.292 | 61.9 |
| 1600 | 0.208 | 47.1 | 3.506 | 24.5 | 0.083 | −56.4 | 0.313 | 51.5 |
PACKAGE DIMENSIONS

PACKAGE DIMENSIONS
(Units: mm)

PIN CONNECTIONS
1. GND
2. OUTPUT
3. Vcc
4. INPUT

EQUIVALENT CIRCUIT
[MEMO]
[MEMO]
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Anti-radioactive design is not implemented in this product.