Features
- Ultra-Low Phase Noise
- Variable Input Frequency 100 - 400 MHz
- Variable Input Power from 18 - 24 dBm
- Output Harmonics to 20 GHz
- SMT680 Surface Mount Package
- SMA850 Hermetic Package
- No Bias or Tuning Required
- RoHS* Compliant

Description
The MLPNC-7100 is a low phase noise comb generator (LPNC) with a flexible range of input frequency and power. It is based on monolithic non-linear-transmission-line (NLTL) circuit technology and its banner spec is its ultra-low phase noise. The phase noise shown is at the 120th harmonic (12 GHz) and at any other harmonic it can be calculated using the analytical equation \( P_{NN} = P_{NN120} - 20 \log (120 - N) \) N<120. It is available in both coaxial and surface mount packages.

Operating Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Recommended Input</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Min.</td>
</tr>
<tr>
<td>Frequency</td>
<td>MHz</td>
<td>100</td>
</tr>
<tr>
<td>Power</td>
<td>dBm</td>
<td>18</td>
</tr>
</tbody>
</table>

1. The model MLPNC-7100 does not abruptly stop working at the recommended min and max frequencies and powers. The conversion efficiency drops outside recommended limits.

Production Test Limits

<table>
<thead>
<tr>
<th>MLPNC-7100-SMA850 Input / Power</th>
<th>Units</th>
<th>Output Harmonics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>4 GHz</td>
</tr>
<tr>
<td>100 MHz, 22 dBm</td>
<td>dBm</td>
<td>&gt; -23</td>
</tr>
<tr>
<td>250 MHz, 20 dBm</td>
<td>dBm</td>
<td>&gt; -11</td>
</tr>
<tr>
<td>400 MHz, 20 dBm</td>
<td>dBm</td>
<td>&gt; -8</td>
</tr>
</tbody>
</table>

<table>
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</table>

1 ^ Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

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DC-0010996
Typical Performance Curves using SMA package @ 100 MHz Input:

**Harmonic Output, @ $P_{IN} = 18$ dBm**

**Harmonic Output, @ $P_{IN} = 20$ dBm**

**Harmonic Output, @ $P_{IN} = 22$ dBm**

**Harmonic Output, @ $P_{IN} = 24$ dBm**

**Phase Noise, 22 dBm $P_{IN}$, 12 GHz Output**

**Absolute Maximum Ratings**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Power</td>
<td>27 dBm</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-45°C to +85°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-55°C to +125°C</td>
</tr>
<tr>
<td>Temperature Cycling</td>
<td>-55°C to +125°C</td>
</tr>
</tbody>
</table>

2. Exceeding any one or combination of these limits may cause permanent damage to this device.
3. MACOM does not recommend sustained operation near these survivability limits.
Typical Performance Curves using SMA package @ 250 MHz Input:

**Harmonic Output, @ $P_{IN} = 18$ dBm**

**Harmonic Output, @ $P_{IN} = 20$ dBm**

**Harmonic Output, @ $P_{IN} = 22$ dBm**

**Harmonic Output, @ $P_{IN} = 24$ dBm**
Typical Performance Curves using SMA package @ 400 MHz Input:

**Harmonic Output, @ \( P_{in} = 18 \) dBm**

**Harmonic Output, @ \( P_{in} = 20 \) dBm**

**Harmonic Output, @ \( P_{in} = 22 \) dBm**

**Harmonic Output, @ \( P_{in} = 24 \) dBm**
Typical Performance Curves using SMT package @ 100 MHz Input:

**Harmonic Output, @ P_{in} = 18 dBm**

- 25°C
- 85°C
- 45°C

**Harmonic Output, @ P_{in} = 20 dBm**

- 25°C
- 85°C
- 45°C

**Harmonic Output, @ P_{in} = 22 dBm**

- 25°C
- 85°C
- 45°C

**Harmonic Output, @ P_{in} = 24 dBm**

- 25°C
- 85°C
- 45°C
Typical Performance Curves using SMT package @ 250 MHz Input:

- **Harmonic Output, @ \( P_{in} = 18 \text{ dBm} \)**
  - Harmonic Frequency (GHz) vs. Harmonic Power (dBm)
  - Graphs show the relationship between harmonic power and frequency for input powers of 18 dBm.

- **Harmonic Output, @ \( P_{in} = 20 \text{ dBm} \)**
  - Similar to the previous graph, but for input power of 20 dBm.

- **Harmonic Output, @ \( P_{in} = 22 \text{ dBm} \)**
  - Graph for input power of 22 dBm.

- **Harmonic Output, @ \( P_{in} = 24 \text{ dBm} \)**
  - Graph for input power of 24 dBm.
Typical Performance Curves using SMT package @ 400 MHz Input:

**Harmonic Output, @ $P_{in} = 18 \text{ dBm}$**

![Graph](image1)

**Harmonic Output, @ $P_{in} = 20 \text{ dBm}$**

![Graph](image2)

**Harmonic Output, @ $P_{in} = 22 \text{ dBm}$**

![Graph](image3)

**Harmonic Output, @ $P_{in} = 24 \text{ dBm}$**

![Graph](image4)
Outline: SMT680

Top View

Side View

Bottom View

Dimensions in inches [mm]
Outline: SMA850, hermetic

Dimensions in inches [mm]
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