Features
- Ultra-Low Phase Noise
- Variable Input Frequency 600 - 1500 MHz
- Variable Input Power from 19 - 24 dBm
- Output Harmonics to 30 GHz
- SMT680 Surface Mount Package
- SMA800 Hermetically Package
- No Bias or Tuning Required
- RoHS* Compliant

Description
The MLPNC-7103 is a monolithic non-linear-transmission-line (NLTL) comb generator which offers outstanding phase noise performance. This high performance comb generator operates over specified ranges of input frequency/power.

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>600</td>
</tr>
<tr>
<td>Power</td>
<td>dBm</td>
<td>19</td>
</tr>
</tbody>
</table>

1. The model MLPNC-7103 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>Part Number</th>
<th>Units</th>
<th>Output Harmonics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>6 GHz</td>
</tr>
<tr>
<td>MLPNC-7103-SMA800</td>
<td>dBm</td>
<td>&gt; -5</td>
</tr>
<tr>
<td>MLPNC-7103-SMT680</td>
<td>dBm</td>
<td>&gt; -5</td>
</tr>
</tbody>
</table>

2. Input frequency and power are 1000 MHz and 22 dBm.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLPNC-7103-SMA800</td>
<td>ESD Box with Foam</td>
</tr>
<tr>
<td>MLPNC-7103-SMT680</td>
<td>ESD Box with Foam</td>
</tr>
</tbody>
</table>

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>

3. Exceeding any one or combination of these limits may cause permanent damage to this device.
4. MACOM does not recommend sustained operation near these survivability limits.

* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.
Typical Performance Curves using SMA package @ 600 MHz:

**Harmonic Output, @ $P_{IN} = 19$ dBm**

![Graph showing harmonic output at $P_{IN} = 19$ dBm](image)

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

![Graph showing harmonic output at $P_{IN} = 22$ dBm](image)

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

![Graph showing harmonic output at $P_{IN} = 24$ dBm](image)
Typical Performance Curves using SMA package @ 1000 MHz:

**Harmonic Output, @ $P_{IN} = 19$ dBm**

![Typical Performance Curve](image1)

-30  -20  -10  0  10  20  30
0  6  12  18  24  30
Harmonic Frequency (GHz)
Harmonic Power (dBm)

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

![Typical Performance Curve](image2)

-30  -20  -10  0  10  20  30
0  6  12  18  24  30
Harmonic Frequency (GHz)
Harmonic Power (dBm)

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

![Typical Performance Curve](image3)

-30  -20  -10  0  10  20  30
0  6  12  18  24  30
Harmonic Frequency (GHz)
Harmonic Power (dBm)

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

![Typical Performance Curve](image4)

-100  -110  -120  -130  -140  -150
100  1000  10000  100000
Offset Frequency (Hz)
Phase Noise (dBc/Hz)
Typical Performance Curves using SMA package @ 1500 MHz:

**Harmonic Output, @ $P_{IN} = 19$ dBm**

![Graph showing harmonic output at 19 dBm with temperature variations][1]

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

![Graph showing harmonic output at 22 dBm with temperature variations][2]

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

![Graph showing harmonic output at 24 dBm with temperature variations][3]
Typical Performance Curves using SMT package @ 600 MHz:

**Harmonic Output, @ P\textsubscript{IN} = 19 dBm**

![Graph](image1)

**Harmonic Output, @ P\textsubscript{IN} = 22 dBm**

![Graph](image2)

**Harmonic Output, @ P\textsubscript{IN} = 24 dBm**

![Graph](image3)
NLTL Comb Generator

Typical Performance Curves using SMT package @ 1000 MHz:

**Harmonic Output, @ P_{IN} = 19 dBm**

![Graph showing harmonic output at 19 dBm]

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

![Graph showing harmonic output at 22 dBm]

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

![Graph showing harmonic output at 24 dBm]
Typical Performance Curves using SMT package @ 1500 MHz:

**Harmonic Output, @ $P_{in} = 19$ dBm**

-20  -10  0   10   20   30
Harmonic Power (dBm)

0  6  12  18  24  30
Harmonic Frequency (GHz)

-20  -10  0   10   20   30
Harmonic Power (dBm)

0  6  12  18  24  30
Harmonic Frequency (GHz)

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

-20  -10  0   10   20   30
Harmonic Power (dBm)

0  6  12  18  24  30
Harmonic Frequency (GHz)

-20  -10  0   10   20   30
Harmonic Power (dBm)

0  6  12  18  24  30
Harmonic Frequency (GHz)

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

-20  -10  0   10   20   30
Harmonic Power (dBm)

0  6  12  18  24  30
Harmonic Frequency (GHz)
Outline: SMT680

Dimensions in inches [mm]
Outline: SMA800, hermetic

Dimensions in inches [mm]
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