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>Frequency</td>
<td>MHz</td>
<td>600 - 1000 - 1500</td>
</tr>
<tr>
<td>Power</td>
<td>dBm</td>
<td>19 - 22 - 24</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>
<th>6 GHz</th>
<th>12 GHz</th>
<th>18 GHz</th>
<th>24 GHz</th>
<th>30 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLPNC-7103-SMA800</td>
<td>dBm</td>
<td>&gt; -5</td>
<td>&gt; -8</td>
<td>&gt; -15</td>
<td>&gt; -18</td>
<td>&gt; -20</td>
<td></td>
</tr>
<tr>
<td>MLPNC-7103-SMT680</td>
<td>dBm</td>
<td>&gt; -5</td>
<td>&gt; -8</td>
<td>&gt; -21</td>
<td>&gt; -28</td>
<td>&gt; -30</td>
<td></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\text{in} = 19 dBm**

![Graph showing harmonic output at 19 dBm]

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

![Graph showing harmonic output at 22 dBm]

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

![Graph showing harmonic output at 24 dBm]
Typical Performance Curves using SMA package @ 1000 MHz:

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

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

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

**Phase Noise, @ 12 GHz Output, \( P_{IN} = 22 \) dBm**
Typical Performance Curves using SMA package @ 1500 MHz:

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

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

Harmonic Output, @ $P_{IN} = 24$ dBm
Typical Performance Curves using SMT package @ 600 MHz:

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

![Harmonic Output, @ P\textsubscript{IN} = 19 dBm](image1)

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

![Harmonic Output, @ P\textsubscript{IN} = 22 dBm](image2)

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

![Harmonic Output, @ P\textsubscript{IN} = 24 dBm](image3)
Typical Performance Curves using SMT package @ 1000 MHz:

**Harmonic Output, @ \( P_{in} = 19 \text{ dBm} \)**

-30 0 10 20 30

Harmonic Power (dBm)

0 6 12 18 24 30

Harmonic Frequency (GHz)

-30 0 10 20

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

-30 0 10 20 30

Harmonic Power (dBm)

0 6 12 18 24 30

Harmonic Frequency (GHz)

-30 0 10 20

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

-30 0 10 20 30

Harmonic Power (dBm)

0 6 12 18 24 30

Harmonic Frequency (GHz)
Typical Performance Curves using SMT package @ 1500 MHz:

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

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

Harmonic Output, @ $P_{in} = 24$ dBm
Outline: SMT680

Top View

Side View

Bottom View

Dimensions in inches [mm]

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**Outline**: SMA800, hermetic

Dimensions in inches [mm]

MLPNC-7103

NLTL Comb Generator

Rev. V7

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