Surface Mount (SMT) Voltage Controlled Oscillator (VCO) From 850 MHz to 900 MHz, Phase Noise of -113 dBC/Hz and 0.5 inch Package

**Voltage Control Oscillators Technical Data Sheet**

**Features**
- 850 MHz to 900 MHz Bandwidth
- -113 dBC/Hz @ 10kHz offset
- Tuning Voltage 0.0V to 4.5V
- Pout = +1.5 dBm
- Harmonics = -45 dBC
- RoHs Compliant Assembly
- 0.5” SMT package
- Industry Standard Mounting Footprint
- Designed to meet MIL-STD-202 Environmental Conditions

**Applications**
- Phase Locked Loop
- Function Generators
- Frequency Synthesizers
- Receivers
- Electronic Jamming Equipment
- Local Oscillator
- Wireless Communications
- SATCOM
- Optical Communications
- Military Electronic Systems

**Description**

The PE1V15001 is a High Reliability Low Noise Voltage Controlled Oscillator (VCO) which covers a 850 MHz to 900 MHz frequency band with a voltage tuning range from 0.0V to 4.5V. This design has exceptionally good Phase Noise performance of -113 dBC/Hz of such a wide frequency band. Supply Voltage is +5V with a generated output power level of +1.5 dBm with an excellent 2nd harmonic output response of -45 dBC typical. The assembly is RoHs compliant and available in a compact 0.5 inch SMT package with an industry standard mounting footprint. The bottom surface is copper clad with 2-5 micro inches of immersion Gold over 150-250 micro inches of Electro less Nickel which makes it resistant to oxidation for ease of soldering. The VCO operates over a temperature range of -40°C to +85°C and is designed to meet a variety of MIL-STD-202 test conditions including Humidity, Shock, and Vibration.

**Electrical Specifications**

<table>
<thead>
<tr>
<th>Description</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>850</td>
<td>900</td>
<td></td>
<td>MHz</td>
</tr>
<tr>
<td>Tuning Voltage</td>
<td>0</td>
<td>4.5</td>
<td></td>
<td>Vdc</td>
</tr>
<tr>
<td>Supply Voltage (DC)</td>
<td>4.5</td>
<td>5</td>
<td>5.5</td>
<td>Vdc</td>
</tr>
<tr>
<td>Supply Current (DC)</td>
<td>13</td>
<td>17</td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>Phase Noise @ 1kHz Offset</td>
<td>-88</td>
<td>-85</td>
<td></td>
<td>dBC/Hz</td>
</tr>
<tr>
<td>Phase Noise @ 10kHz Offset</td>
<td>-113</td>
<td>-111</td>
<td></td>
<td>dBC/Hz</td>
</tr>
<tr>
<td>Phase Noise @ 100kHz Offset</td>
<td>-133</td>
<td>-132</td>
<td></td>
<td>dBC/Hz</td>
</tr>
<tr>
<td>Output Power</td>
<td>-0.5</td>
<td>+1.5</td>
<td>+3</td>
<td>dBm</td>
</tr>
<tr>
<td>Output Power Delta @-40 deg C</td>
<td></td>
<td></td>
<td>+1.2</td>
<td>dBm</td>
</tr>
<tr>
<td>Output Power Delta @+85 deg C</td>
<td></td>
<td></td>
<td>-1.8</td>
<td>dBm</td>
</tr>
<tr>
<td>Tuning Sensitivity (Kvco)</td>
<td>8</td>
<td></td>
<td>24</td>
<td>MHz/V</td>
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<tr>
<td>Pushing</td>
<td>0.3</td>
<td>0.4</td>
<td></td>
<td>MHz/V</td>
</tr>
<tr>
<td>Pulling (pk-pk)</td>
<td>200</td>
<td>400</td>
<td></td>
<td>kHz</td>
</tr>
<tr>
<td>Load Impedance</td>
<td>30</td>
<td></td>
<td></td>
<td>pF</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Frequency Drift @-40 deg C</th>
<th>4 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Drift @+85 deg C</td>
<td>-3300 KHz</td>
</tr>
<tr>
<td>2nd Harmonics</td>
<td>-45 -40 dBC</td>
</tr>
</tbody>
</table>

#### Mechanical Specifications

- **Size**
  - Length: 0.5 in [12.7 mm]
  - Width: 0.5 in [12.7 mm]
  - Height: 0.125 in [3.18 mm]
- **Weight**: 0.01 lbs [4.54 g]
- **Body Material and Plating**: Copper Clad, Nickel, Gold
- **Design**: Commercial

#### Environmental Specifications

- **Temperature**
  - Operating Range: -40 to +85 deg C
  - Storage Range: -55 to +125 deg C
- **Humidity**: MIL-STD-202, Method 103, 90% RH, +65 C
- **Shock**: MIL-STD-202, Method 213I
- **Vibration**: MIL-STD-202, Method 204D
- **Temperature Cycle**: MIL-STD-202, Method 107B
- **ESD Sensitivity**: ESD Sensitive Material, Transport material in Approved ESD bags. Handle only in ESD Workstation.

#### Compliance Certifications

- **RoHS Compliant**
- **REACH Compliant**

**Plotted and Other Data**

- **Notes:**

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Typical Performance Data

Phase Noise

Frequency vs Tuning Voltage

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Tuning Sensitivity

Output Power vs Tuning Voltage

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Surface Mount (SMT) Voltage Controlled Oscillator (VCO) From 850 MHz to 900 MHz, Phase Noise of -113 dBc/Hz and 0.5 inch Package from Pasternack Enterprises has same day shipment for domestic and International orders. Our RF, microwave and millimeter wave products maintain a 99% availability and are part of the broadest selection in the industry.

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The information contained in this document is accurate to the best of our knowledge and representative of the part described herein. It may be necessary to make modifications to the part and/or the documentation of the part, in order to implement improvements. Pasternack reserves the right to make such changes as required. Unless otherwise stated, all specifications are nominal. Pasternack does not make any representation or warranty regarding the suitability of the part described herein for any particular purpose, and Pasternack does not assume any liability arising out of the use of any part or documentation.
PE1V15001 CAD Drawing
Surface Mount (SMT) Voltage Controlled Oscillator (VCO) From 850 MHz to 900 MHz, Phase Noise of -113 dBc/Hz and 0.5 inch Package

NOTES:
1. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MILLIMETERS.
2. UNLESS OTHERWISE SPECIFIED FINISH IS 15-25 MICROINCHES ELECTROLESS NICKEL OVER COPPER, 24 MICROINCHES IMMERSION GOLD OVER NICKEL.
3. MOD PORT NOT AVAILABLE ON ALL MODELS.
Surface Mount (SMT) Voltage Controlled Oscillator (VCO) From 850 MHz to 900 MHz, Phase Noise of -113 dBC/Hz and 0.5 inch Package

PE1V15001 CAD Drawing

PCB PAD LAYOUT

NOTES:
1. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS (MM).
2. UNLESS OTHERWISE SPECIFIED, FINISH IS 150-250 MICRO INCHES ELECTROLESS NICKEL OVER COPPER, 25 MICRO INCHES IMMERSION GOLD OVER NICKEL.
3. MOD PORT NOT AVAILABLE ON ALL MODELS.

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**Table 1: Hand Soldering**

<table>
<thead>
<tr>
<th>Item</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tip Temp. (max.)</td>
<td>260°C</td>
</tr>
<tr>
<td>Iron Power (max.)</td>
<td>20 W</td>
</tr>
<tr>
<td>Time (max.)</td>
<td>3 Sec.</td>
</tr>
</tbody>
</table>

**Table 2: Package re-flow temp**

<table>
<thead>
<tr>
<th>Pkg.</th>
<th>tp (°C)</th>
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<tbody>
<tr>
<td>PE2V Series</td>
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<tr>
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<td>All Others</td>
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**NOTES:**
1. ALL VCO’S HAVE A MS RATING OF 1
2. ALL PRODUCTS CONFORM TO JEDEC J-STD-020C FOR LEAD FREE PROCESSING.

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