Surface Mount (SMT) Voltage Controlled Oscillator (VCO) From 4.8 GHz to 5.2 GHz, Phase Noise of -80 dBc/Hz and 0.175 inch Package

Voltage Control Oscillators Technical Data Sheet

PE2V011

Features
- 4.8 GHz to 5.2 GHz Bandwidth
- -80 dBc/Hz @ 10kHz offset
- Tuning Voltage 0V to 3.0V
- Pout = +1.0 dBm
- Harmonics = -20 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 PE2V011 is a High Reliability Low Noise Voltage Controlled Oscillator (VCO) which covers a 4.8 GHz to 5.2 GHz frequency band with a voltage tuning range from 0V to 3.0V. This design features exceptional phase noise performance of -80 dBc/Hz @ 10 kHz offset. Supply Voltage is +3.3V with a generated output power level of +1.0 dBm and 2nd harmonic output of -20 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>4.8</td>
<td></td>
<td>5.2</td>
<td>GHz</td>
</tr>
<tr>
<td>Tuning Voltage</td>
<td>0</td>
<td></td>
<td>3</td>
<td>Vdc</td>
</tr>
<tr>
<td>Supply Voltage (DC)</td>
<td>3</td>
<td>3.3</td>
<td>3.6</td>
<td>Vdc</td>
</tr>
<tr>
<td>Supply Current (DC)</td>
<td>9</td>
<td>10</td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>Phase Noise @ 10kHz Offset</td>
<td>-80</td>
<td>-75</td>
<td></td>
<td>dBc/Hz</td>
</tr>
<tr>
<td>Phase Noise @ 100kHz Offset</td>
<td>-101</td>
<td>-98</td>
<td></td>
<td>dBc/Hz</td>
</tr>
<tr>
<td>Output Power</td>
<td>+1</td>
<td></td>
<td>+4</td>
<td>dBm</td>
</tr>
<tr>
<td>Tuning Sensitivity (Kvco)</td>
<td>160</td>
<td></td>
<td>300</td>
<td>MHz/V</td>
</tr>
<tr>
<td>Pushing</td>
<td>4</td>
<td>6</td>
<td></td>
<td>MHz/V</td>
</tr>
<tr>
<td>Pulling (pk-pk)</td>
<td>25</td>
<td>45</td>
<td></td>
<td>MHz</td>
</tr>
<tr>
<td>Load Impedance</td>
<td>50</td>
<td></td>
<td></td>
<td>Ohms</td>
</tr>
<tr>
<td>2nd Harmonics</td>
<td>-20</td>
<td>-15</td>
<td></td>
<td>dBc</td>
</tr>
</tbody>
</table>

Click the following link (or enter part number in “SEARCH” on website) to obtain additional part information including price, inventory and certifications: Surface Mount (SMT) Voltage Controlled Oscillator (VCO) From 4.8 GHz to 5.2 GHz, Phase Noise of -80 dBc/Hz and 0.175 inch Package PE2V011

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### Mechanical Specifications

<table>
<thead>
<tr>
<th>Size</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>0.175 in [4.45 mm]</td>
</tr>
<tr>
<td>Width</td>
<td>0.175 in [4.45 mm]</td>
</tr>
<tr>
<td>Height</td>
<td>0.075 in [1.91 mm]</td>
</tr>
<tr>
<td>Weight</td>
<td>0.01 lbs [4.54 g]</td>
</tr>
<tr>
<td>Body Material and Plating</td>
<td>Copper Clad, Nickel, Gold</td>
</tr>
<tr>
<td>Design</td>
<td>Commercial</td>
</tr>
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</table>

### Environmental Specifications

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

### Compliance Certifications

RoHS Compliant
REACH Compliant 12/17/2015

### Plotted and Other Data

Click the following link (or enter part number in “SEARCH” on website) to obtain additional part information including price, inventory and certifications: [Surface Mount (SMT) Voltage Controlled Oscillator (VCO) From 4.8 GHz to 5.2 GHz, Phase Noise of -80 dBc/Hz and 0.175 inch Package PE2V011](#)
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Typical Performance Data

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Surface Mount (SMT) Voltage Controlled Oscillator (VCO) From 4.8 GHz to 5.2 GHz, Phase Noise of -80 dBc/Hz and 0.175 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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Surface Mount (SMT) Voltage Controlled Oscillator (VCO) From 4.8 GHz to 5.2 GHz, Phase Noise of -80 dBc/Hz and 0.175 inch Package

**PAD DETAIL**

- 0.025 [0.6]
- 0.025 [0.6]
- 0.050 [1.3]
- 0.065 [1.7]
- 0.088 [2.22]
- 0.175 [4.44]

<table>
<thead>
<tr>
<th>Pin</th>
<th>Con.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vcc</td>
</tr>
<tr>
<td>3</td>
<td>RF</td>
</tr>
<tr>
<td>7</td>
<td>Vt</td>
</tr>
<tr>
<td>Others</td>
<td>GND</td>
</tr>
</tbody>
</table>

**PCB PAD LAYOUT**

- 0.000
- 0.025 [0.63]
- 0.088 [2.22]
- 0.150 [3.81]
- 0.175 [4.44]

**NOTES:**

1. THE CASE IS GROUND.
2. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES [mm].
3. UNLESS OTHERWISE SPECIFIED FINISH IS 150-250 MICRO INCHES ELECTROLESS NICKEL OVER COPPER CLAD PCB, 2-5 MICRO INCHES IMMERSION GOLD, OVER NICKEL.
4. SOLDER MASK NOT USED FOR APPLICATIONS GREATER THAN 6GHz.
Surface Mount (SMT) Voltage Controlled Oscillator (VCO) From 4.8 GHz to 5.2 GHz, Phase Noise of -80 dBc/Hz and 0.175 inch Package

Table 1
Hand Soldering

<table>
<thead>
<tr>
<th>Item</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tip Temp. (max.)</td>
<td>260°</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>
</tr>
</thead>
<tbody>
<tr>
<td>PE2V Series</td>
<td>260</td>
</tr>
<tr>
<td>PE1V11 Series</td>
<td>245</td>
</tr>
<tr>
<td>All Others</td>
<td>245</td>
</tr>
</tbody>
</table>

Notes:
1. ALL VCO'S HAVE A MS RATING OF 1
2. ALL PRODUCTS CONFORM TO JEDEC J-STD-020C FOR LEAD FREE PROCESSING.