2x Frequency Multiplier Module, 8 GHz to 21 GHz Output Frequency, +10 dBm Output Power, Field Replaceable SMA

Frequency Multipliers Technical Data Sheet

PE88X2003

Features
• Frequency Doubler
• Wide Frequency Band
• GaAs HBT MMIC Technology
• Low Phase Noise -142 dBc/Hz @ 100 kHz offset
• Output Power +14 dBm
• Dual Bias Voltages +12 VDC and -5 VDC

• Integrated DC Blocking Capacitors
• Hermetically Sealed Module
• Mil Spec Compliant
• Field Replaceable SMA Connectors
• -55°C to +85°C Operating Temperature

Applications
• Electronic Warfare
• Electronic Countermeasures
• Point-To-Point Radio
• Point-To-Multipoint Radio
• VSAT Radios
• Fiber Optic
• Space Systems
• Test Instrumentation
• Telecom Infrastructure

Description
The PE88X2003 is a low noise X2 active broadband frequency multiplier module that covers a wide output frequency bandwidth from 8 GHz to 21 GHz. The frequency doubler design utilizes advanced GaAs HBT MMIC semiconductor technology that produces low additive SSB phase noise performance with a typical level of -142 dBc/Hz at 100 kHz offset. Additional typical performance includes an output power level of +14 dBm with an input signal of +6 dBm. Input/output ports are matched for 50 ohms and are DC blocked. The design also incorporates integrated bias sequencing circuitry and voltage regulators to allow for flexible biasing for both the negative and positive voltage supplies. The compact drop-in package is RoHS compliant and hermetically sealed with field replaceable SMA connectors. And for added confidence, this rugged package assembly is designed to meet MIL-STD-883 test conditions for hermeticity and temperature cycle.

Electrical Specifications (TA= 25°C, VDC1 = 12 Vdc, VDC2 = -5 Vdc, IDC1 = 102 mA, IDC2 = 5 mA, Input Power = +6 dBm)

<table>
<thead>
<tr>
<th>Description</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Frequency Range</td>
<td>4</td>
<td>10.5</td>
<td></td>
<td>GHz</td>
</tr>
<tr>
<td>Output Frequency Range</td>
<td>8</td>
<td>21</td>
<td></td>
<td>GHz</td>
</tr>
<tr>
<td>Impedance</td>
<td></td>
<td>50</td>
<td></td>
<td>Ohms</td>
</tr>
<tr>
<td>Input Power (CW)</td>
<td>+6</td>
<td></td>
<td></td>
<td>dBm</td>
</tr>
<tr>
<td>Output Power</td>
<td>+10</td>
<td>+14</td>
<td></td>
<td>dBm</td>
</tr>
<tr>
<td>Fundamental Harmonic Suppression</td>
<td>16</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Phase Noise @100kHz Offset</td>
<td>-142</td>
<td></td>
<td></td>
<td>dBc/Hz</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>14</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Output Return Loss</td>
<td>10</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Operating DC Voltage 1</td>
<td>12</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Operating DC Current 1</td>
<td>102</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>Operating DC Voltage 2</td>
<td>-5</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Operating DC Current 2</td>
<td>5</td>
<td></td>
<td></td>
<td>mA</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: 2x Frequency Multiplier Module, 8 GHz to 21 GHz Output Frequency, +10 dBm Output Power, Field Replaceable SMA PE88X2003
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**Mechanical Specifications**

<table>
<thead>
<tr>
<th>Size</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Length</td>
<td>1.086 in [27.58 mm]</td>
</tr>
<tr>
<td>Width</td>
<td>0.85 in [21.59 mm]</td>
</tr>
<tr>
<td>Height</td>
<td>0.28 in [7.11 mm]</td>
</tr>
<tr>
<td>Weight</td>
<td>0.09 lbs [40.82 g]</td>
</tr>
<tr>
<td>Input Connector</td>
<td>Field Replaceable SMA Female</td>
</tr>
<tr>
<td>Output Connector</td>
<td>Field Replaceable SMA Female</td>
</tr>
</tbody>
</table>

**Environmental Specifications**

**Temperature**
- Operating Range: -55 to +85 deg C
- Storage Range: -65 to +150 deg C

**Temperature Cycling**
- MIL-STD-883, Method 101C, Cond B

**Hermetic Seal**
- Gross Leak MIL-STD-883 Method 1014C1/Fine Leak
- MIL-STD-883, Method 1014A2, 5 x 10^-8 atm cc
- ESD Sensitive Material, Transport material in Approved ESD bags. Handle only in ESD Workstation.

**Compliance Certifications** (see product page for current document)

**Plotted and Other Data**

**Notes:**

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Typical Performance Data

Output Power vs. Temperature @ 6 dBm Drive Level

Output Power vs. Drive Level

Output Power vs. Input Power

Isolation @ 6 dBm Drive Level

SSB Phase Noise Performance
   Fout = 15 GHz, Input Power = 6 dBm

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Input Return Loss vs. Temperature @ 0 dBm Drive Level

Output Return Loss vs. Temperature @ 0 dBm Drive Level

2x Frequency Multiplier Module, 8 GHz to 21 GHz Output Frequency, +10 dBm Output Power, Field Replaceable SMA 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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PE88X2003 CAD Drawing
2x Frequency Multiplier Module, 8 GHz to 21 GHz Output Frequency, +10 dBm Output Power, Field Replaceable SMA