



Frequency Divider, Divide by 5 Prescaler Module,  
500 MHz to 8 GHz, Field Replaceable SMA

Frequency Dividers Technical Data Sheet

PE88D5000

**Features**

- Divide by 5 Prescaler
- Wide Frequency Band
- GaAs HBT MMIC Technology
- Low Phase Noise -155 dBc/Hz @ 100 kHz offset
- Output Power -1 dBm
- Low Reverse Leakage Level 58 dB typical
- Single +5V Bias Voltage
- 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 PE88D5000 is a low noise Divide-by-5 Static Prescaler Module that covers a wide input frequency bandwidth from 0.5 GHz to 8 GHz. The design utilizes advanced GaAs HBT MMIC semiconductor technology that produces low additive SSB phase noise performance with a typical level of -155 dBc/Hz at 100 kHz offset. Additional typical performance includes an output power level of -1 dBm and reverse leakage up to 58 dB. Input/output ports are matched for 50 ohms and are DC blocked. The design requires a single +5V DC supply. 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, Vd1 = 5 V, Id1 = 80 mA)

| Description                 | Minimum | Typical | Maximum | Units |
|-----------------------------|---------|---------|---------|-------|
| Input Frequency (Sine Wave) | 0.5     |         | 8       | GHz   |
| Impedance                   |         | 50      |         | Ohms  |
| Input Power (CW)            | -20     |         |         | dBm   |
| Output Power                | -4      | -1      |         | dBm   |
| Reverse Leakage             |         | 58      |         | dB    |
| Operating DC Voltage 1      |         | 5       |         | V     |
| Operating DC Current 1      |         | 80      |         | mA    |

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [Frequency Divider, Divide by 5 Prescaler Module, 500 MHz to 8 GHz, Field Replaceable SMA PE88D5000](#)



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**Performance by Frequency**

| Description                      | Conditions                  | Min. | Typ. | Max. | Units  |
|----------------------------------|-----------------------------|------|------|------|--------|
| Maximum Input Frequency          |                             | 8    | 9    |      | GHz    |
| Minimum Input Frequency          | Sine Wave Input             |      |      | 0.5  | GHz    |
| Input Power Range                | Fin = 0.5 To 7 GHz          | -20  | -15  | +15  | dBm    |
|                                  | Fin = 7 To 8 GHz            | -20  | -15  | +10  | dBm    |
| Output Power                     | Fin = 0.5 To 8 GHz          | -4   | -1   |      | dBm    |
| Reverse Leakage                  | Fin = 0.5 To 8 GHz          |      | 58   |      | dB     |
| SSB Phase Noise (100 KHz Offset) | Pin = 0 dBm, Fin = 4.8 GHz  |      | -155 |      | dBc/Hz |
| Output Transition Time           | Pin = 0 dBm, Fout = 882 MHz |      | 100  |      | ps     |
| Supply Current (Idc)             |                             |      | 80   |      | mA     |

**Mechanical Specifications**

**Size**

|        |                    |
|--------|--------------------|
| Length | 0.64 in [16.26 mm] |
| Width  | 0.59 in [14.99 mm] |
| Height | 0.29 in [7.37 mm]  |
| Weight | 0.06 lbs [27.22 g] |

**Body Material and Plating**

|                        |                              |
|------------------------|------------------------------|
| Input Connector        | Field Replaceable SMA Female |
| Output Connector       | Field Replaceable SMA Female |
| Power Supply Connector | Solder Pin                   |

**Environmental Specifications**

**Temperature**

|                 |                   |
|-----------------|-------------------|
| Operating Range | -55 to +85 deg C  |
| Storage Range   | -65 to +150 deg C |

**Temperature Cycling**

|                 |   |
|-----------------|---|
| Hermetic Seal   | MIL-STD-883, Method 101C, Cond B<br>Gross Leak MIL-STD-883 Method 1014C1/Fine Leak<br>MIL-STD-883, Method 1014A2, 5 x 10-8 atm cc |
| ESD Sensitivity | ESD Class 1A Material, Transport in Approved ESD bags. Handle only in approved ESD Workstation.                                   |



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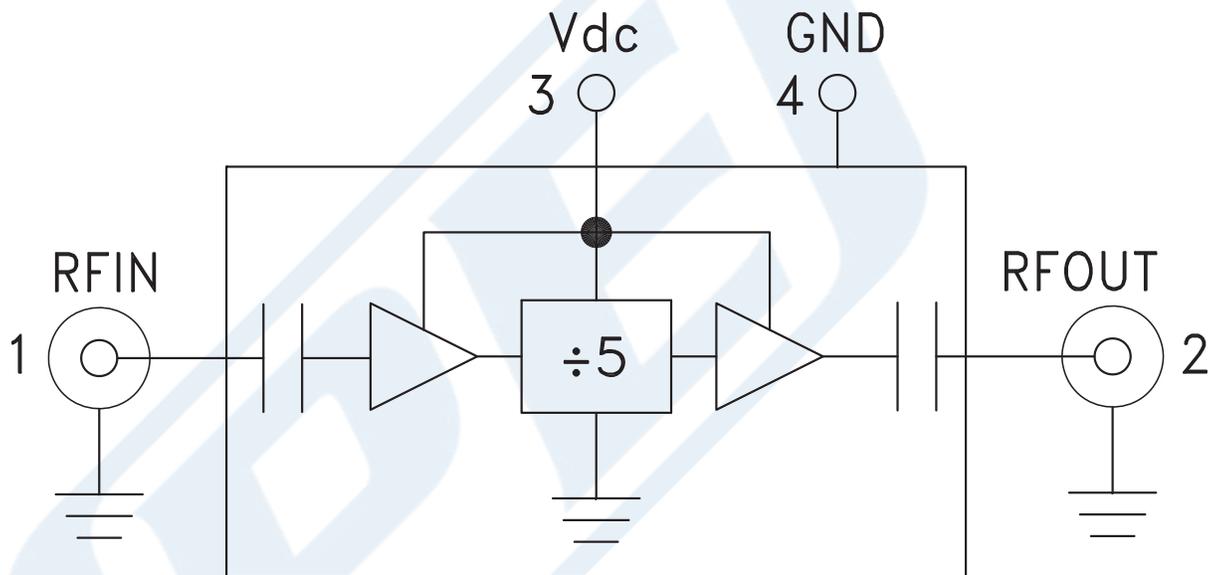
## Frequency Dividers Technical Data Sheet

PE88D5000

**Compliance Certifications** (visit [www.Pasternack.com](http://www.Pasternack.com) for current document)  
RoHS Compliant

**Plotted and Other Data**  
Notes:

**Functional Block Diagram**



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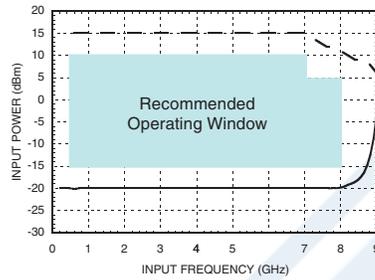
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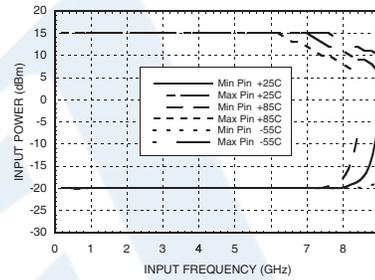
PE88D5000

Typical Performance Data

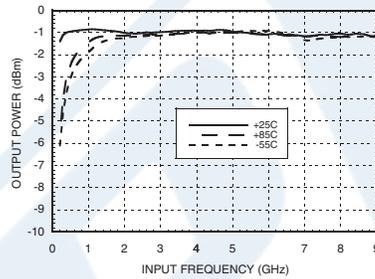
Input Sensitivity Window,  $T = 25\text{ }^{\circ}\text{C}$



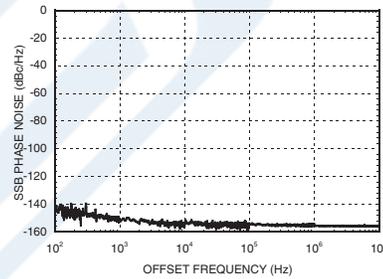
Input Sensitivity vs. Temperature



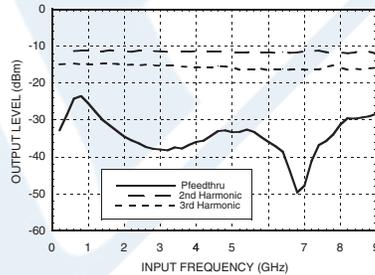
Output Power vs. Temperature



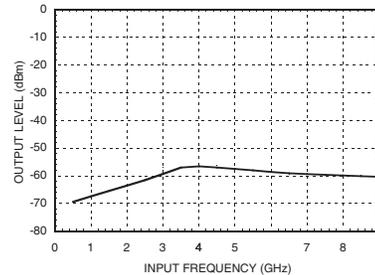
SSB Phase Noise Performance,  $P_{in} = 0\text{ dBm}, T = 25\text{ }^{\circ}\text{C}$



Output Harmonic Content,  $P_{in} = 0\text{ dBm}, T = 25\text{ }^{\circ}\text{C}$



Reverse Leakage,  $P_{in} = 0\text{ dBm}, T = 25\text{ }^{\circ}\text{C}$

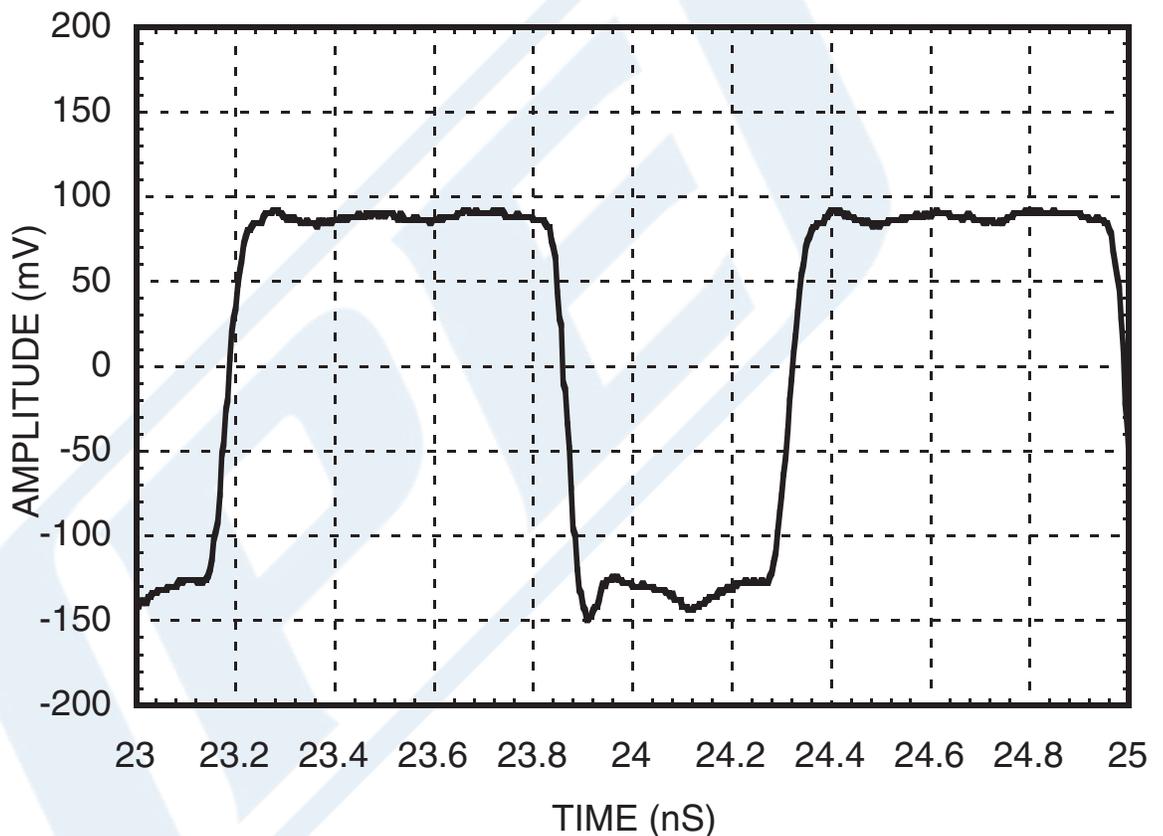


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## Output Voltage Waveform, $P_{in} = 0 \text{ dBm}$ , $F_{out} = 882 \text{ MHz}$ , $T = 25 \text{ }^\circ\text{C}$



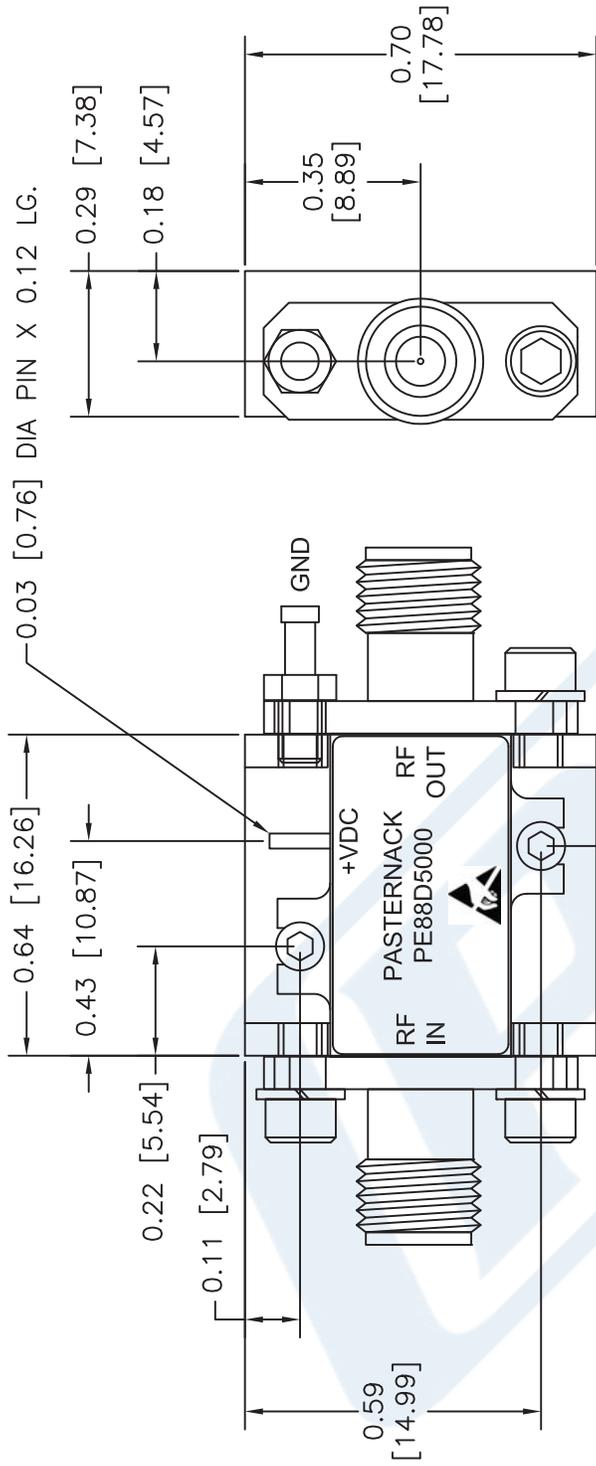
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URL: <http://www.pasternack.com/frequency-divider-divide-5-prescaler-module-500-mhz-8-ghz-sma-pe88d5000-p.asp>

# PE88D5000 CAD Drawing

Frequency Divider, Divide by 5 Prescaler Module,  
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SMA  
FEMALE  
(Field Replaceable)  
TYP.

Lot No. \_\_\_\_\_  
#0-80 HARDWARE THRU  
0.074 [1.88] DIA THRU  
(REMOVE HARDWARE TO  
MOUNT ASSEMBLY)

NOTE:  
HEAT SINK REQUIRED FOR PROPER OPERATION,  
UNIT IS COOLED BY CONDUCTING TO HEAT SINK.

|  |  |  |                  |               |             |
|--|--|--|------------------|---------------|-------------|
| <p>DWG TITLE</p> <h2>PE88D5000</h2>                      |  | <p>NOTES:</p> <ol style="list-style-type: none"> <li>UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE NOMINAL.</li> <li>ALL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AT ANY TIME.</li> <li>DIMENSIONS ARE IN INCHES [mm].</li> </ol> |                  |               |             |
| <p>FSCM NO. 53919</p>                                    |  | <p>CAD FILE 050616</p>   | <p>SCALE N/A</p> | <p>SIZE A</p> | <p>2233</p> |
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