



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)

Description	Minimum	Typical	Maximum	Units
Input Frequency Range	4		10.5	GHz
Output Frequency Range	8		21	GHz
Impedance		50		Ohms
Input Power (CW)		+6		dBm
Output Power	+10	+14		dBm
Fundamental Harmonic Suppression		16		dBc
Phase Noise @100kHz Offset		-142		dBc/Hz
Input Return Loss		14		dB
Output Return Loss		10		dB
Operating DC Voltage 1		12		V
Operating DC Current 1		102		mA
Operating DC Voltage 2		-5		V
Operating DC Current 2		5		mA

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](#)



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

Frequency Multipliers Technical Data Sheet

PE88X2003

Mechanical Specifications

Size

Length	1.086 in [27.58 mm]
Width	0.85 in [21.59 mm]
Height	0.28 in [7.11 mm]
Weight	0.09 lbs [40.82 g]
Input Connector	Field Replaceable SMA Female
Output Connector	Field Replaceable SMA Female

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
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.

ESD Sensitivity



Compliance Certifications (see [product page](#) for current document)

Plotted and Other Data

Notes:

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](#)

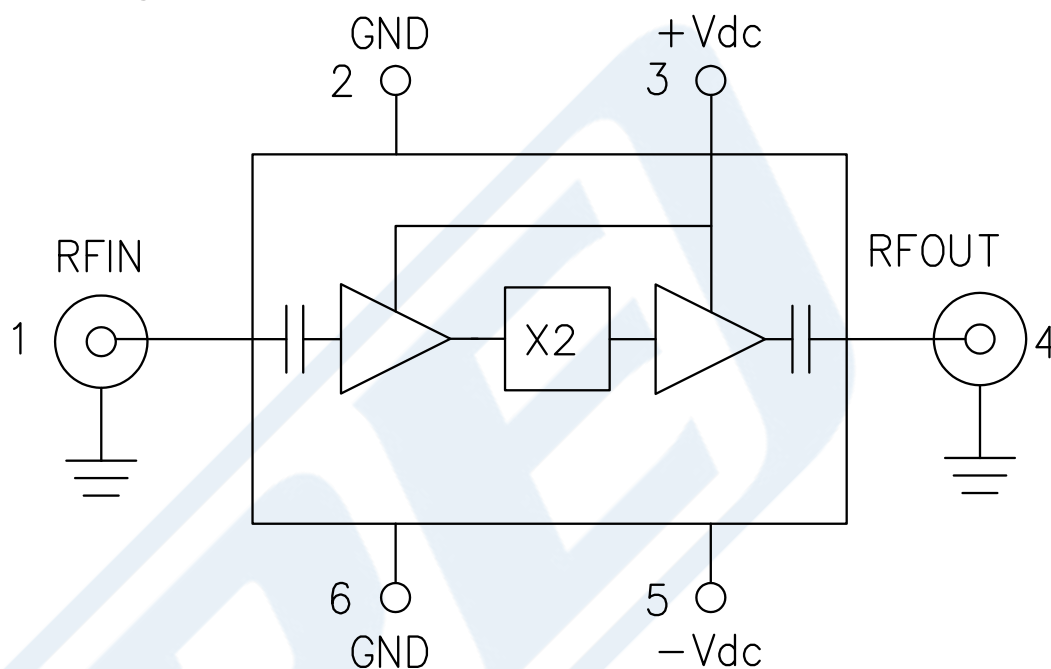


2x Frequency Multiplier Module, 8 GHz to 21 GHz Output Frequency, +10 dBm Output Power, Field Replaceable SMA

Frequency Multipliers Technical Data Sheet

PE88X2003

Functional Block Diagram



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](#)



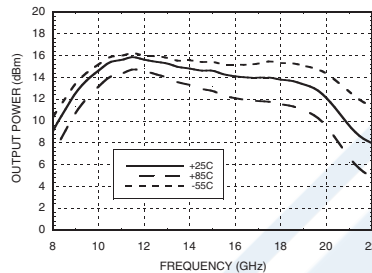
2x Frequency Multiplier Module, 8 GHz to 21 GHz Output Frequency, +10 dBm Output Power, Field Replaceable SMA

Frequency Multipliers Technical Data Sheet

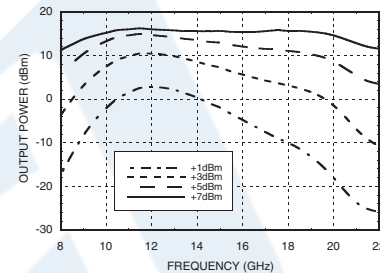
PE88X2003

Typical Performance Data

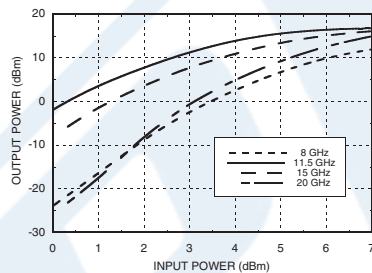
Output Power vs. Temperature @ 6 dBm Drive Level



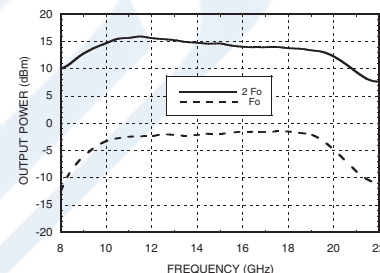
Output Power vs. Drive Level



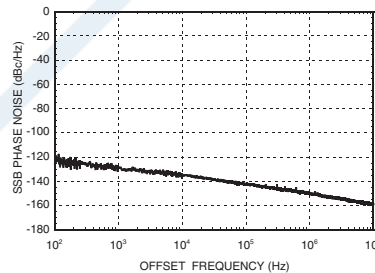
Output Power vs. Input Power



Isolation @ 6 dBm Drive Level



SSB Phase Noise Performance
 $F_{out} = 15 \text{ GHz}$, Input Power = 6 dBm



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](#)

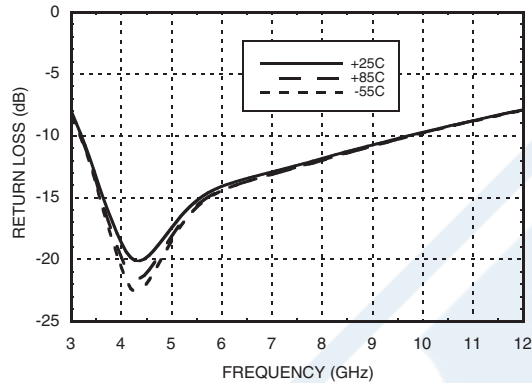


2x Frequency Multiplier Module, 8 GHz to 21 GHz Output Frequency, +10 dBm Output Power, Field Replaceable SMA

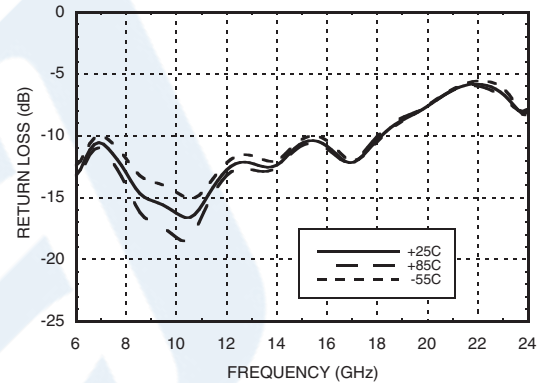
Frequency Multipliers Technical Data Sheet

PE88X2003

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.

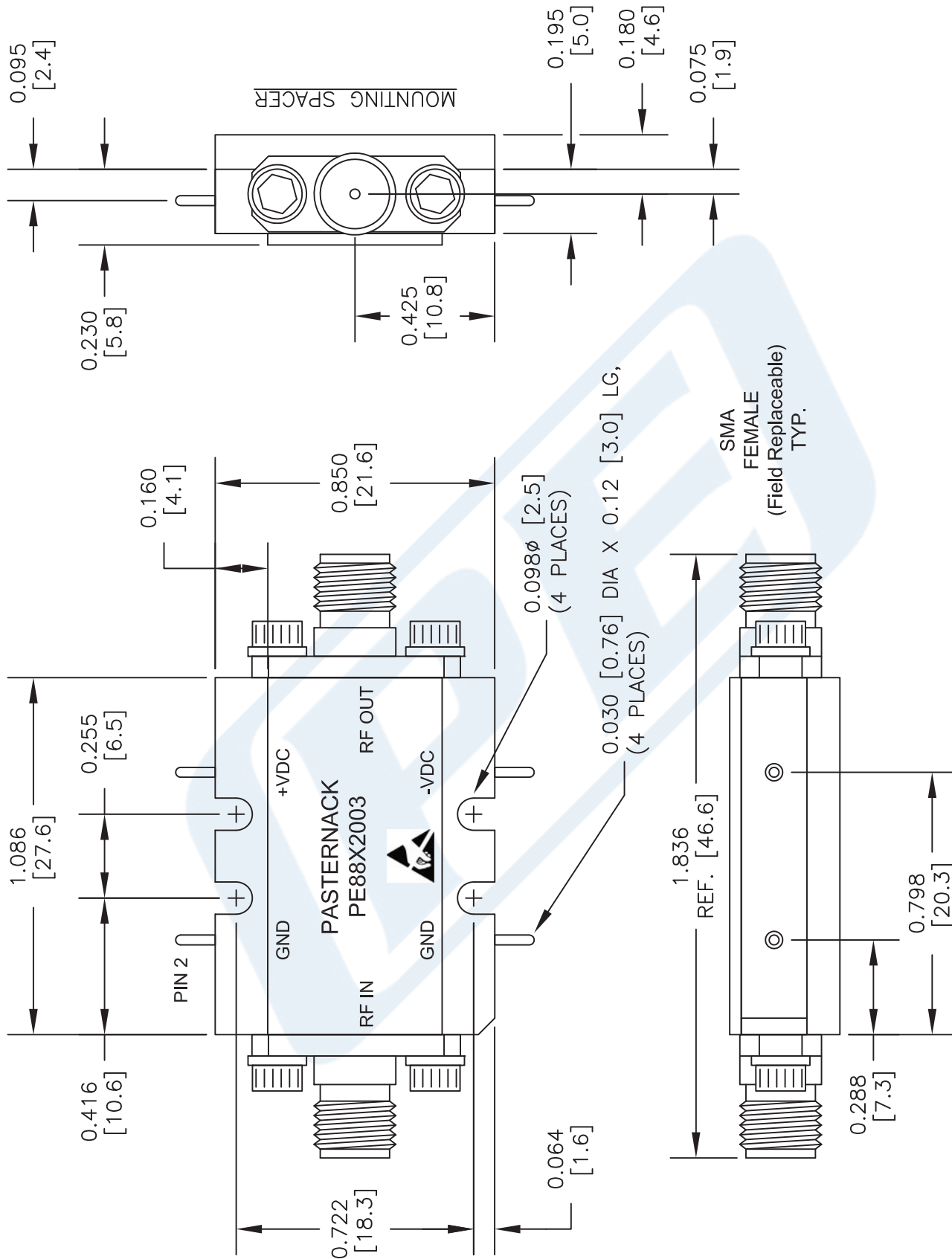
Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [2x Frequency Multiplier Module, 8 GHz to 21 GHz Output Frequency, +10 dBm Output Power, Field Replaceable SMA PE88X2003](https://www.pasternack.com/2x-frequency-multiplier-module-21-ghz-10-dbm-sma-pe88x2003-p.aspx)

URL: <https://www.pasternack.com/2x-frequency-multiplier-module-21-ghz-10-dbm-sma-pe88x2003-p.aspx>

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.

PE88X2003 CAD Drawing

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



NOTES:
1. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE NOMINAL.
2. ALL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AT ANY TIME.
3. DIMENSIONS ARE IN INCHES [mm].

DWG TITLE

PE88X2003

FSCM NO. 53919

CAD FILE 090616

SCALE N/A

SIZE A

2233

PE PASTERNAK
THE ENGINEER'S RF SOURCE

Pasternack Enterprises, Inc.
P.O. Box 16759 | Irvine | CA | 92623
Phone: (949) 261-1920 | Fax: (949) 261-7451
Website: www.pasternack.com | E-Mail: sales@pasternack.com