



Double Balanced Mixer Operating From 23 GHz to 37 GHz With an IF Range From DC to 13 GHz And LO Power of +13 dBm, Field Replaceable 2.92mm

Mixers Technical Data Sheet

PE86X1002

Features

- Double Balanced Mixer Module
- RF/LO Frequency 23 to 37 GHz
- Wide IF Bandwidth DC to 13 GHz
- GaAs MESFET MMIC Technology
- No external components or matching circuitry
- LO Drive level +13 dBm
- Low Conversion loss 9 dB
- High LO/RF Isolation 35 dB
- Hermetically Sealed Module
- Mil Spec Compliant
- Field Replaceable Connectors
- -55°C to +85°C Operating Temperature

Applications

- Electronic Warfare
- Point-to-Point Radios
- Point-to-Multipoint Radios
- VSAT
- Radar
- Space Systems
- Test Instrumentation
- Sensors
- Telecom Infrastructure
- Military End-Use

Description

The PE86X1002 is a double balanced mixer module that operates across an RF and LO frequency range from 23 GHz to 37 GHz with a wide IF frequency range of DC to 13 GHz. The design utilizes GaAs MESFET MMIC technology and requires no external components or matching circuitry. Excellent LO to RF and LO to IF Isolation levels of 35 dB that are the result of using optimized balun structures. The LO drive level is +13 dBm with typical conversion loss of 9 dB and an input IP3 level up to +19 dBm. The drop-in package is hermetically sealed with field replaceable 2.92mm connectors for the RF and LO ports, and an SMA connector for the IF port. Operating temperature range is -55°C to +85°C. And for added confidence, this rugged package assembly is designed to meet MIL-STD-883 test conditions for Hermeticity and Temperature Cycle, and the design exhibits a robust 1000V ESD, Class IC rating.

Electrical Specifications (TA = +25° C, IF= 1 GHz, LO = +13 dBm)

Description	Minimum	Typical	Maximum	Units
RF Frequency Range	23		37	GHz
LO Frequency Range	23		37	GHz
IF Frequency Range	DC		13	GHz
Impedance	50			Ohms
Conversion Loss	9	12		dB
Noise Figure	9	12		dB
LO to RF Isolation	20	35		dB
LO to IF Isolation	20	35		dB
RF to IF Isolation	13	25		dB
Input at 1dB Compression Point	+12			dBm
Input at 2nd Order Intercept Point		+50		dBm
Input at 3rd Order Intercept Point		+19		dBm

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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.



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RF Input Power		+23	dBm
LO Input Power	+11	+13	dBm
IF Input Power		+25	dBm

Electrical Specification Notes:

All measurements performed as downconverter unless otherwise noted.
Conversion loss measured as IRM.

Mechanical Specifications

Size

Length	0.89 in [22.61 mm]
Width	0.68 in [17.27 mm]
Height	0.36 in [9.14 mm]
Weight	0.079 lbs [35.83 g]

Configuration

Design	Double Balanced
Connector Option	Field Replaceable
RF Connector	2.92mm Female
LO Connector	2.92mm Female
IF Connector	SMA Female

Environmental Specifications

Temperature

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

Temperature Cycle
Hermetic Seal

MIL-STD-883, Method 101C, Cond B
Gross Leak MIL-STD-883 Method 1014C1/Fine Leak

ESD Sensitive

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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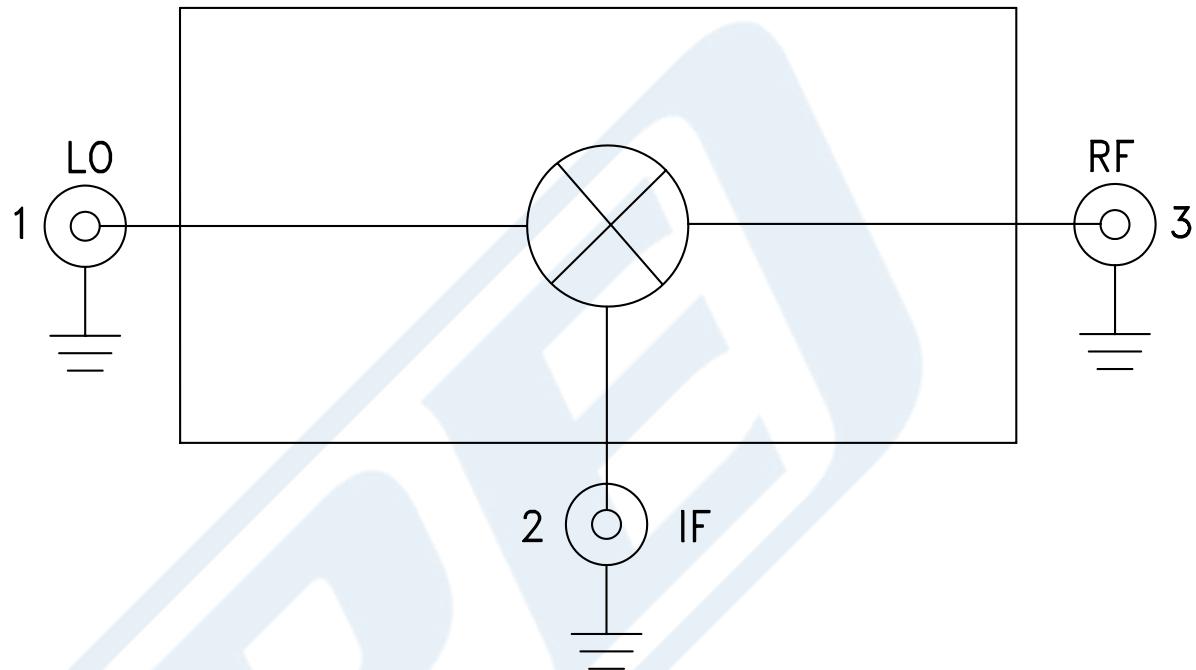


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Functional Block Diagram



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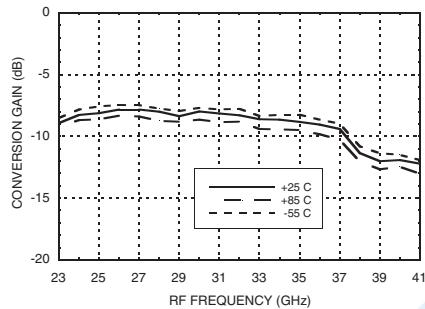
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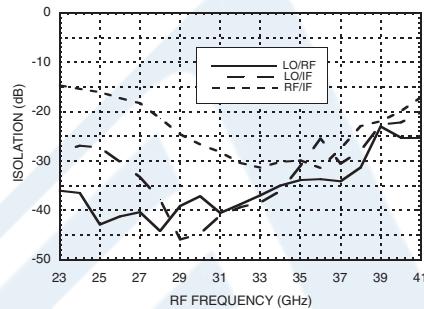
PE86X1002

Typical Performance Data

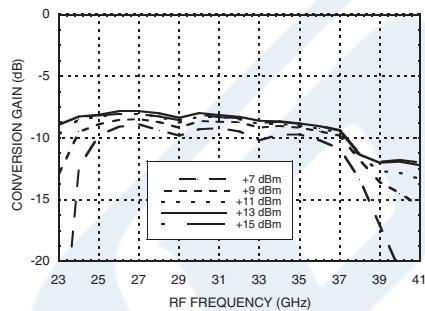
Conversion Gain vs. Temperature



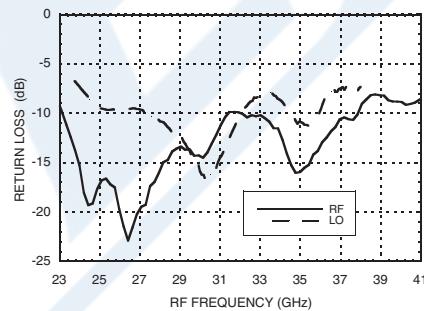
Isolation



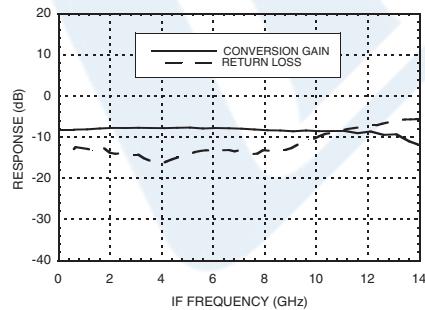
Conversion Gain vs. LO Drive



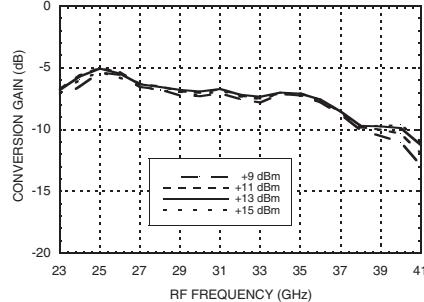
Return Loss



IF Bandwidth Downconversion with Low Side LO = 24 GHz @ +13 dBm



Upconverter Performance, Conversion Gain vs. LO Drive for Fixed 1 GHz IF Input and Low Side LO



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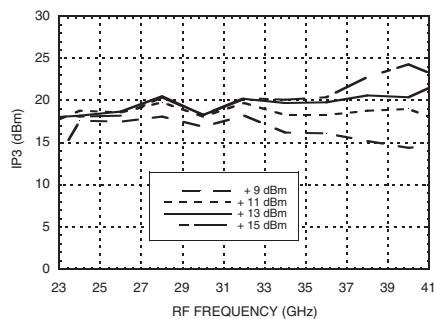


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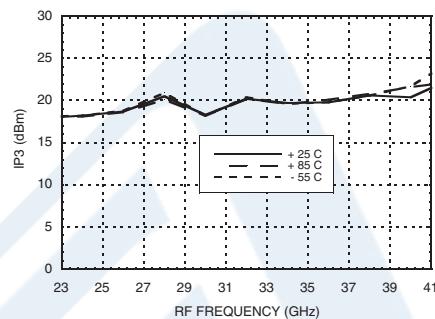
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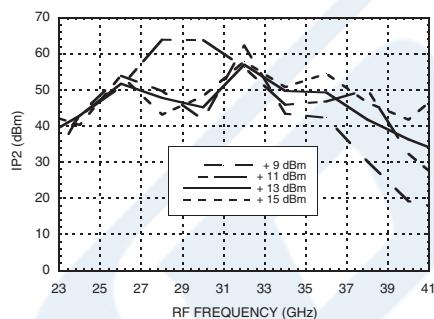
Input IP3 vs. LO Drive *



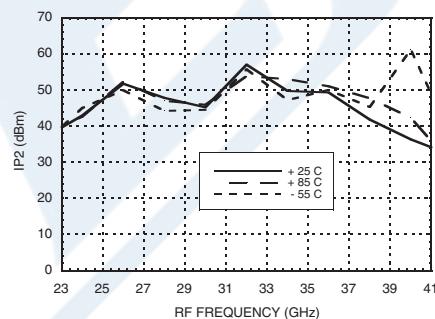
Input IP3 vs. Temperature*



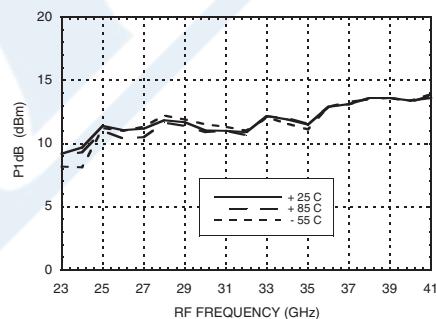
Input IP2 vs. LO Drive *



Input IP2 vs. Temperature *



Input P1dB vs. Temperature



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MxN Spurious Outputs

	nLO				
mRF	0	1	2	3	4
0	xx	0	13	xx	xx
1	8	0	29	xx	xx
2	69	53	50	64	xx
3	xx	78	80	67	86
4	xx	xx	87	92	94

RF = 24 GHz @ -10 dBm
 LO = 25 GHz @ +13 dBm
 All values in dBc below the IF output power level (-1 RF + 1 LO).

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Double Balanced Mixer Operating From 23 GHz to 37 GHz With an IF Range From DC to 13 GHz And LO Power of +13 dBm, Field Replaceable 2.92mm 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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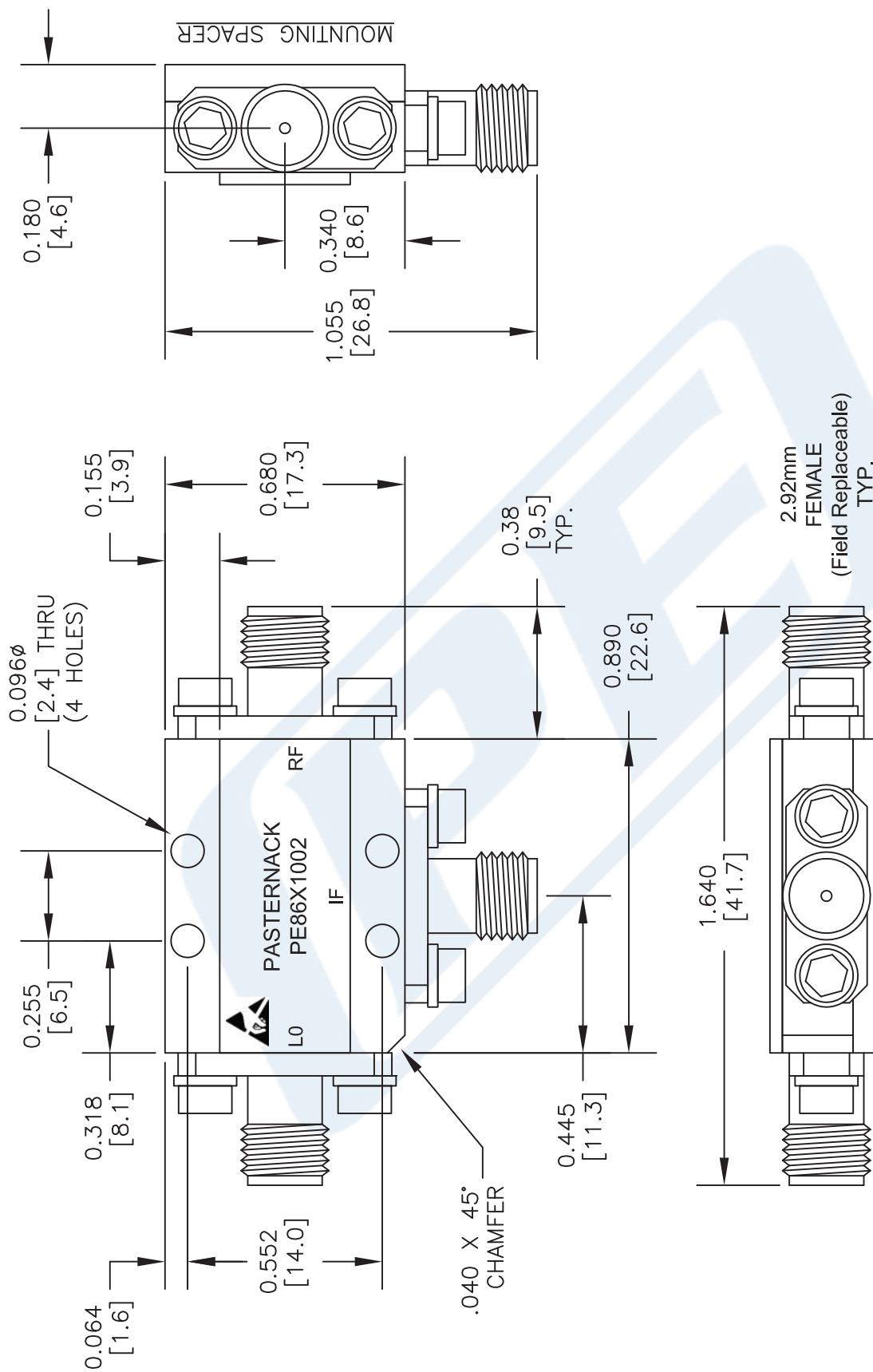
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PE86X1002 CAD Drawing

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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	PE86X1002	FSCM NO.	53919	CAD FILE	050316	SCALE	N/A	SIZE	A	2233
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