LOW NOISE, WIDEBAND, LOW CURRENT

Monolithic Amplifier PMA2-123LN5+

50Ω 0.5 to 12 GHz

THE BIG DEAL

- Ultra wideband, 0.5 to 12 GHz
- Excellent noise figure, 1.8 dB at 12GHz
- Low Current, 30mA
- Usable up to 18 GHz



Generic photo used for illustration purposes only

CASE STYLE: MC1631-1

+RoHS Compliant
The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

APPLICATIONS

- WiFi / LTE
- Satellite Communications
- Military and Commercial Radar applications
- Point-to-Point Radio applications

PRODUCT OVERVIEW

The PMA2-123LN5+ is a E-PHEMT based wideband, low noise MMIC amplifier with a unique combination of low noise, high IP3, and low current making it ideal for sensitive, high-dynamic-range receiver applications. This design operates on a single +5V supply, is well matched for 50Ω and comes in a tiny, low profile package (2 x 2 mm, 8 lead MCLP), accommodating dense circuit board layouts.

KEY FEATURES

Feature	Advantages
Excellent Noise Figure up to 18 GHz • 1.8 dB typ. at 12 GHz • 2.4 dB typ. at 18 GHz	Industry leading combination of low noise and wideband frequency enables lower system noise figure performance.
High IP3 • +24 dBm at 0.5 GHz • +24.1 dBm at 12 GHz	Combination of low noise figure and high IP3 makes this MMIC amplifier ideal for use in low noise receiver front end (RFE) as it gives the user advantages of sensitivity and two-tone IM performance at both ends of the dynamic range.
Low operating voltage & current +5V & 30mA	Low voltage & current consumption is ideal for use in amplifier chain.
2 x 2mm 8-lead MCLP package	Tiny footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.

REV. B
ECO-023615
PMA2-123LN5+
MCL NY
241127

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ELECTRICAL SPECIFICATIONS[1] AT 25°C, V_{DD}= +5V UNLESS NOTED OTHERWISE

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		0.5		12	GHz
Noise Figure	0.5		1.4		dB
	5		1.2		
	10		1.6		
	12		1.8		
	18		2.4		
Gain	0.5	16.0	17.7	19.5	dB
	5	—	15.1	—	
	10	9.7	11.6	13.4	
	12	9.0	10.7	12.5	
	18	—	7.6	—	
Reverse Isolation	10	—	24.4	—	dB
Input Return Loss	0.5		6		dB
	5		10		
	10		10		
	12		10		
	18		7		
Output Return Loss	0.5		12		dB
	5		17		
	10		12		
	12		11		
	18		6		
Output Power at 1dB Compression	0.5		+12.3		dBm
	5		+12.2		
	10		+11.6		
	12		+11.5		
	18		+9.6		
Output IP3	0.5		+24.0		dBm
	5		+23.4		
	10		+23.5		
	12		+24.1		
	18		+21.6		
Device Operating Voltage (V_{DD})			+5		V
Device Operating Current (I_{DD})		—	30	47	mA
Device Current Variation vs. Temperature[2]			7.69		µA/°C
Device Current Variation vs. Voltage			0.008		mA/mV
Thermal Resistance, junction-to-case			69.8		°C/W

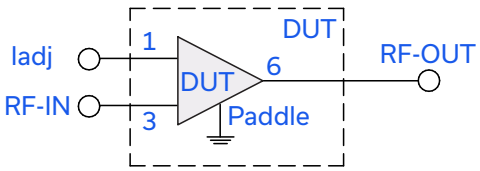
1. Measured on Mini-Circuits Characterization Test Board TB-PMA2-123LN5+. See Characterization Test Circuit (Fig. 1) and de-embedded to the device reference plane.
2. (Current at 85°C - Current at -45°C)/130

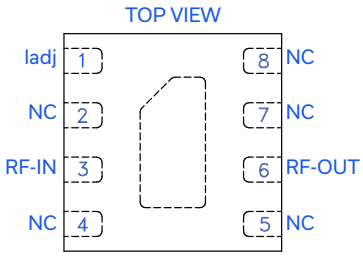
ABSOLUTE MAXIMUM RATINGS[3]

Parameter	Ratings
Operating Temperature (ground lead)	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Junction Temperature	150 °C
Total Power Dissipation	0.65 W
Input Power (CW), Vd=+5V	+24 dBm (5 minutes max.) +7 dBm (continuous)
DC Voltage	+7 V

3. Permanent damage may occur if any of these limits are exceeded. Electrical maximum ratings are not intended for continuous normal operation.

SIMPLIFIED SCHEMATIC & PAD DESCRIPTION





Function	Pad Number	Description (See Figure 1)
RF-IN	3	Connects to RF input via a blocking capacitor.
RF-OUT & DC-IN	6	Connects to RF out and V_{DD} via Bias-Tee & 68.1 Ohm resistor
Ground	Paddle	Connects to ground
No Connection	2,4,5,7,8	Not used internally. Connected to ground on Test Board.
Iadj	1	Current adjust pad. Open on test board.

CHARACTERIZATION TEST CIRCUIT

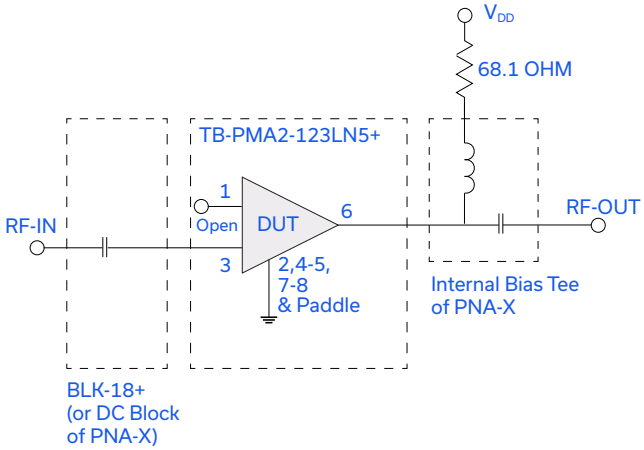
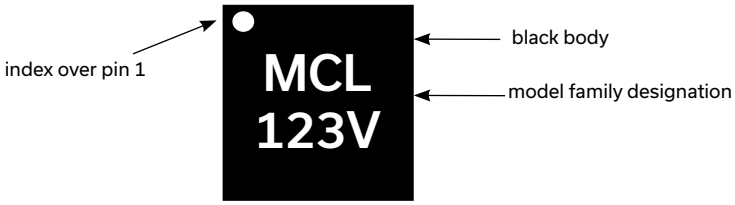


Fig 1. Characterization Circuit
Note: This block diagram is used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-PMA2-123LN5+)
Gain, Return loss, Output power at 1dB compression (P1 dB), output IP3 (OIP3) and noise figure measured using Agilent's N5242A PNA-X microwave network analyzer.

Conditions:
1. Gain and Return loss: Pin= -25dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, -5dBm/tone at output.

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

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50Ω 0.5 to 12 GHz

ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD. TO ACCESS CLICK HERE

Performance Data	Data Table Swept Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	MC1631-1 Plastic package, exposed paddle, lead finish: Matte-Tin
Tape & Reel **Standard quantities available on reel**	F66 7" reels with 20, 50, 100, 200, 500, 1K, 2K or 3K devices
Suggested Layout for PCB Design	PL-626
Evaluation Board	TB-PMA2123LN5E+ (Includes all components for turn-key evaluation across 0.5 to 12 GHz)
Environmental Ratings	ENV08T1

ESD RATING

Human Body Model (HBM): Class 1A (250 to <500V) in accordance with ANSI/ESD STM 5.1 - 2001

NOTES

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits' standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html