

Low Current, Wideband, Ceramic

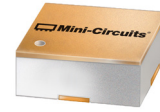
Monolithic Amplifier

CMA-183L+

50Ω DC to 18 GHz

The Big Deal

- Ceramic, hermetically sealed, nitrogen filled
- Super Wideband, DC to 18 GHz, usable to 20 GHz
- Excellent Gain Flatness ± 2.1 dB
- Low Current, 20 mA typ



CASE STYLE: LZ1737

MIL Screening Available
Please consult Applications Dept.

Product Overview

The CMA-183L+ is a low current, wideband gain block that operates up to 20 GHz fabricated using highly reliable GaAs HBT process. This Darlington pair amplifier delivers excellent gain flatness, good return loss, low current with acceptable P1dB and OIP3 across a wide bandwidth without the need of external matching network. It has highly repeatable performance from lot to lot and it is packaged in an LTCC hermetic package utilizing fully automated and highly reliable manufacturing processes. CMA-series amplifiers are capable of meeting MIL requirements for gross leak, fine leak, thermal shock, vibration, acceleration, mechanical shock, and HTOL. The tests can be performed if requested.

Key Features

Feature	Advantages
Super Wideband: DC to 18 GHz, usable to 20 GHz	General purpose wideband amplifier is suitable for various applications.
Low Current, 20 mA typ.	Low current consumption is ideal for use in amplifier chain.
Excellent gain flatness: ± 0.7 dB to 10 GHz ± 2.1 dB to 18 GHz	Minimize the need for gain slope compensation to achieve flat gain
No external matching component required	CMA-183L+ provides typical input & output return loss of 15 dB up to 20 GHz without the need for any external matching components.
Ceramic, hermetic package	Highly reliable hermetic package provides predictable and repeatable performance in military applications including ground, air, and ship requirements, and small size 2.25 x 2.25 mm
Very small size 2.25 x 2.25 x 1.1mm	Small size fits into tiny space on motherboard of PCB saving cost

Low Current, Wideband, Ceramic

Monolithic Amplifier

DC-18 GHz

Product Features

- Ceramic, hermetically sealed, high reliability
- Super Wideband, DC to 18 GHz, usable to 20 GHz
- Low Current, 20 mA
- Excellent Gain flatness, ± 2.1 dB
- Repeatable performance (HBT Process)



CMA-183L+

CASE STYLE: LZ1737

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

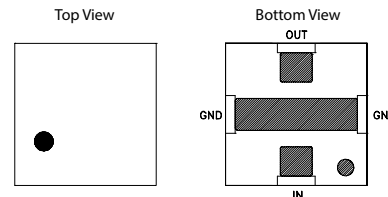
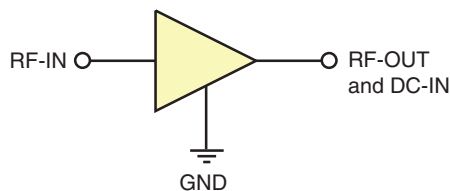
Typical Applications

- Instrumentation
- Cable infrastructure
- 5G

General Description

The CMA-183L+ is a low current, wideband gain block that operates up to 20 GHz fabricated using highly reliable GaAs HBT process. This Darlington pair amplifier delivers excellent gain flatness, good return loss, low current with acceptable P1dB and OIP3 across a wide bandwidth without the need of external matching network. It has highly repeatable performance from lot to lot and it is packaged in an LTCC hermetic package utilizing fully automated and highly reliable manufacturing processes.

simplified schematic and pad description



Function	Pad Number	Description
RF IN	IN	RF-INPUT
RF-OUT and DC-IN	OUT	RF OUTPUT AND DC INPUT
GND	GND	GROUND

Electrical Specifications at 25°C, Vs=5V, R=50Ω unless noted

Parameter	Condition (MHz)	Vs=5V ¹			Units
		Min.	Typ.	Max.	
Frequency Range ⁵		10		18000	MHz
Gain	10	—	15.3	—	dB
	5000	—	14.2	—	
	8000	11.9	14.0	15.4	
	12000	—	13.8	—	
	18000	—	11.1	—	
Input Return Loss	10		16		dB
	5000		9		
	8000		13		
	12000		27		
	18000		20		
Output Return Loss	10		13		dB
	5000		9		
	8000		14		
	12000		16		
	18000		13		
Reverse Isolation	1000		17.1		
Output Power @ 1dB compression	10		7.0		dBm
	5000		5.4		
	8000		5.6		
	12000		5.0		
	18000		1.4		
Output IP3 ²	10		20.1		dBm
	5000		17.5		
	8000		15.8		
	12000		13.3		
	18000		10.2		
Noise Figure	10		6.5		dB
	5000		5.5		
	8000		5.3		
	12000		4.9		
	18000		5.2		
DC Supply (Vs)		4.75	5.0	5.25	V
Device Operating Current		—	20	24	mA
DC Current Variation Vs. Temperature ³			60		μA/°C
DC Current Variation Vs. Voltage ⁴			0.018		mA/mV
Thermal Resistance, junction-to-ground at 85°C stage temp.			367		°C/W

1. Measured on Mini-Circuits Characterization test board TB-668+. See Characterization Test Circuit (Fig. 1)

2. Tested at Pout=-5dBm / tone.

3. (Current at 105°C — Current at -55°C)/160

4. (Current at 5.25V - Current at 4.75V)/((Voltage difference)*1000)

5. Low frequency cut-off determined by external coupling capacitors & RF choke.

Absolute Maximum Ratings⁶

Parameter	Ratings
Operating Temperature (ground lead)	-55°C to 85°C
Storage Temperature	-65°C to 125°C
Junction Temperature	150°C
Total Power Dissipation	0.2 W
Input Power (CW)	+22 dBm (5 minutes max.) +8 dBm (continuous)
Vs Supply Voltage (Pin OUT)	6V

6. Permanent damage may occur if any of these limits are exceeded.

Electrical maximum ratings are not intended for continuous normal operation.



Characterization Test Circuit

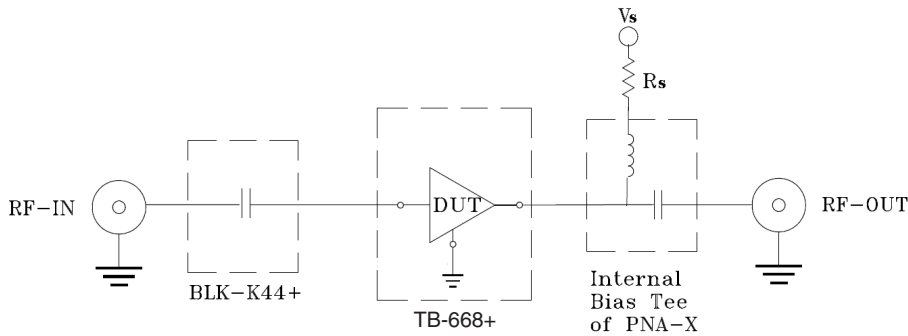


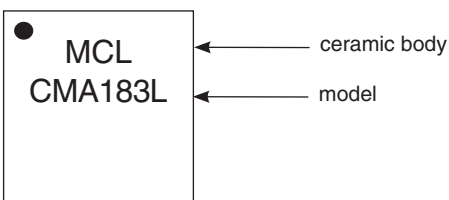
Fig 1. Characterization Circuit

Note: This block diagram is used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-668+) 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. $R_S=49.9$ ohms, $V_s = 5V$

Conditions:

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

Product Marking



Additional Detailed Technical Information	
<i>additional information is available on our dash board. To access this information click here</i>	
Performance Data	Data Table
	Swept Graphs
	S-Parameter (S2P Files) Data Set (.zip file)
Case Style	LZ1737 <i>Ceramic package Terminal finish: NiPdAu</i>
Tape & Reel Standard quantities available on reel	F108 <i>7" reels with 20, 50, 100, 200, 500 or 1K, 2K devices.</i>
Suggested Layout for PCB Design	PL-386
Evaluation Board	TB-668+
Environmental Ratings	ENV-68

ESD Rating

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

Additional 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-Circuit's 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/MCLStore/terms.jsp

